The Chemical Age

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Trade Associations

INDUSTRIAL methods must be atuned to the needs of the times and those who would lead in any branch of the national life must be prepared to suit their methods to existing conditions. An eloquent plea for the extension of the trade association movement was made by Mr. W. Tudor Davies at the Royal Society of Arts in his address on January 25, in which he outlined the case for this movement. The conception of the trade cycle is a legacy from Victorian business methods. It is based upon painful experience of the results of those methods. The world, however, has had enough of these trade booms and depressions, these industrial peaks and valleys. Is it not clear that we have passed beyond the days in which competition was necessary to stimulate production under conditions well described as the economics of scarcity? The new energies released by science and placed at the disposal of industry have brought about a new situation governed by what Mr. Davies calls the "economics of plenty" in which the problems seem to be overproduction and waste and clearance of the overgrowth of competitive redundancy both in production and distribution. The implications of this situation are just beginning to dawn upon us, but we can see that by control of production, prices and sales through co-operative effort it should be possible to smooth out the peaks and valleys of industrial activity, with considerable improvement upon the well-being of mankind generally. That philosopher, John Stuart Mill, many years ago foresaw the condition that would arise after his day, and in our day, when he referred with distaste to the "trampling, crushing, elbowing and treading on each other's toes, which are . . . but the disagreeable symptoms of one of the phases of industrial progress."

The trade association performs many services to its members; it is a way of taking joint action to defend essential joint interests. In some bodies there may be arrangements for the pooling of patents, for the joint purchase of raw materials, for joint advertising campaigns, for co-operative laboratories, for price regulation, and for regulating production. Unquestionably, in its highest development, the trade association helps to clear away competitive redundancy both in production and distribution. The functions of any trade association are adjusted to the particular needs of the industry it serves. It is known that in other countries the movement has gone farther than it has progressed in many instances in Great Britain. The unfair foreign competition that has been forced disagreeably to notice is perhaps an extreme instance of what may happen when Governments act as a dominant partner in the trade association, making it an instrument of national policy. The only effective counter, as this country has already discovered, lies in action by our own trade associations assisted by Government action, which has already been promised. This country cannot allow, for example, its chemical industry nor its chemical plant industry to diminish. Quite evidently it would be impossible to take effective action to safeguard foreign trade unless representative trade associations were in being that could discuss their industrial problems as a body with the Government and negotiate with their foreign counterparts. And the more fully representative a trade association is the more power can it wield on behalf of the trade concerned. It is surprising that any chemical manufacturer should stay outside the A.B.C.M. or any chemical plant manufacturer should be outside the B.C.P.M.A. There are many who believe that closer collaboration between these two bodies would be desirable.

In times of national emergency it must be recognised that the task of the Government in organising national defence is made easier by the existence of trade organisations. Mr. Davies points out that "the trade associations can be used for the mobilisation of industry, particularly now that the Government do not desire to set up a Ministry of Supply." The trade association is still too new for everybody to regard the idea without suspicion, and in particular those associations which safeguard their members' interests in regard to prices and production are not welcomed by purchasers. It should be made clear, however, that it is not in anyone's interest to get the best of the bargain. By buying cheaply, we do not in the long run benefit ourselves, and firms are entitled to see that they receive a fair and just price. Only in that way can the country as a whole remain prosperous. On the other hand, care must be taken that there is no profiteering, but fortunately the integrity of the British business man has prevented any tendency in that direction.

Is it not strange that in this country a duty should be imposed on artificial silk yarn, 90 per cent. of the cost of which is incurred in England, whereas no duty is imposed on cotton yarn, of which only 50 per cent. of its cost is incurred in England? . . . If the Government will act on the industry's recommendations for the removal of the Excise duties, I am convinced that the artificial fibre industry of this country would be able to enormously increase its production.

—*H. Dreyfus.*

NOTES AND COMMENTS

The Panic-Mongers at Work Again

LAST week the Stock Exchange had a bad attack of nerves which almost inevitably spread to large sections of the business community. This week the balance has swung the other way, and markets have shown a little of their old cheer. The occasion of all the upset was fear of what a foreign statesman might say. The prophets of gloom had been up to their old game spreading stories of the inevitable war at an early date, and it was actually left to Herr Hitler to put this nonsense in its proper place. Would it not be well for the Stock Exchange and such business men as allow themselves to be influenced by it, to look nearer home for wisdom and guidance? They may disagree with certain aspects of the present Prime Minister's policy, but after all as he said at Birmingham last Saturday, none of his critics carries the responsibilities that he does, and none of them has that full knowledge of all the circumstances which is only open to the members of the Government. In that speech made two days before Herr Hitler's, Mr. Chamberlain had declared his conviction that there were no differences however serious that could not be solved without recourse to war, by consultation and negotiation as laid down in the Munich declaration signed by Herr Hitler and himself.

Revival of Business Confidence

THIS ought to have been good enough for every British citizen who should not have needed Herr Hitler's statement of his belief in a long period of peace to make him breathe again. The plain truth is that the Munich, Paris and Rome declarations stand, and are not likely to be upset while the British Government pursues its present policy. There is every reason for a revival of confidence among the industrial and commercial classes. We enjoy peace, and if we believe in its continuance we can have increasing prosperity as well. The British Industries Fair is close at hand, and if 1939 proves to be a bumper year both in London and Birmingham, the road will be open to the long retarded enterprise and development which the world would welcome from Great Britain.

The Power Station Chemist

THE discussion following a paper presented to the London Local Technical Group of the Electrical Power Engineers' Association on the sanctions of the chemist in the generating station emphasised the fact of the small number of chemists employed in the electricity generating industry. It is an interesting position because the paper itself made it quite clear that there was ample scope for chemical work in the industry and gave several concrete examples of power station problems, in which the assistance of the chemist, working in close collaboration with the engineer, was necessary. But, as one contributor to the discussion pointed out, there was a general tendency for the industry to rely on outside consultants for advice in its problems and he regarded this as a retrograde step. The same speaker indicated that the reason for this was to be found in what he considered to be the rather poor training facilities for power station chemists in this country. He said that so far as he knew there was only one University, Sheffield, which ran a course in fuel technology (actually, the Imperial College also provides this facility) and only one technical college which catered for the budding fuel technologist. An equally cogent reason might be that the electricity generating industry has not made its demand for chemists sufficiently widely known nor sufficiently attractive. If this is done, the demand can surely be met. Existing arrangements for training might have to be extended, but there is little point in extending them at present if they can already cope with the numbers who wish to receive such training. It was stated that there was no organisation looking after the interests and welfare of power station chemists in particular and suggestions were made as to the way in which such a body might be founded. A special organisation if formed should certainly be able to do much to improve the status of the power station chemist and to conduct fruitful negotiations with the electricity generating industry, for example on the subject of the industry's need of chemists and how it can be best satisfied.

Oil from Coal Research

PROFESSOR W. M. CUMMING uttered a warning against being contented with the present position of research into the home production of oil from coal when he addressed the Royal Philosophical Society at Glasgow last week. He said that the Falmouth report gave for the most part logical arguments against the idea that this country could or should seek to make itself independent of outside supplies under present circumstances, but it would be a catastrophe if the effect of the Report was to create the impression that we need not concern ourselves unduly with the problem of oil from coal. At the moment we barely reached 8 per cent. of our requirements from indigenous materials; in time of war every gallon of that would be welcomed with open arms, irrespective of cost. That quantity could be increased, he added, and it was in the national interest that it be so. Professor Cumming drew attention to one concrete suggestion made in the report of the Socialist party, namely, that the Government increase the grant to the Fuel Research Board from £90,000 to £250,000 per annum. The latter sum represented ¼d. per ton of coal used; it was not an exorbitant sum to pay for the conversion and development of our most important raw material.

The Five Day Week—The Other Side

AS supporters of the "five day week," the proprietors of THE CHEMICAL AGE have invited the views of manufacturers in the numerous trades served by their publications, in order to obtain the widest possible information. A correspondent in *The Timber Trades Journal* makes a severe attack on the shorter week, arguing that the "fewer hours people work the fewer hours they desire to work." He points out that standing charges, such as rent and rates, have to be met for the entire week. We do not suggest that, because a five day basis is feasible in certain trades, it is necessarily desirable in every industry, but the allegation that shorter hours discourage the desire to work is not borne out by the cheerful faces of the employees in most modern factories. Referring to young factory workers, another manufacturer points out that some would rather go to the office or factory on Saturday than do a share of the housework at home, and they have been known to take temporary employment in shops. We do not believe this is the usual experience of firms working on a five day basis, but would be interested to hear from other readers on this point.

Hints on Buying Chemical Plant

By
J. H. WEST, M.I.Chem.E.

ON the face of it there are fewer simpler jobs than that of sending out an inquiry for chemical plant, but if two or three plant manufacturers were asked what proportion of all the inquiries they receive are in such a form that they can quote on them straight away without asking for more information, the answer would be "very few indeed." That this is so is very often due to the fact that the sender of the inquiry has not spent sufficient time on thinking out the item of plant which he wants to buy and deciding what points in connection with it are important and what are not. In other cases he does not realise the necessity of giving the fullest possible information to the manufacturer.

Specifications

Vagueness is the besetting sin of most inquiries. To take a very simple but typical case, the writer, when in charge of the buying and stores department of a certain factory, received on several different occasions a requisition calling for one table! Could anything be more vague. The cure for vagueness is to sit down and think out *exactly* what is required and then write out a specification for it. For some reason many people are scared of the word specification, and if asked to write one would be afraid that they did not know how to set about it. There is, however, nothing formidable about a specification; it is merely a clear, succinct, and detailed statement of all the essential characteristics of the article wanted, and of the conditions under which it is to be supplied and used.

In this article the main principles of writing specifications for plant and equipment will be explained, with one or two fairly complete examples, and later some hints for saving time and trouble when large quantities of plant have to be bought will be given.

The specification should begin with a title or concise description of the plant covered by the inquiry; for example, "Two complete centrifugal pump sets, direct coupled to electric motors, with combined bedplates," or "One distillation plant complete with columns, condensers, heat exchangers, and all other necessary accessories."

Next should follow what is really the most important part of the specification, namely, the statement of performance required. It is here that so many inquiries are vague or insufficient, yet it is essential that the fullest and most detailed information should be given so that the manufacturer shall be in a position to offer the most suitable and most economic plant. Let us take as an example a motor-driven centrifugal pump, a piece of plant to be found in almost every chemical factory. The performance is given under three heads:—

1. Nature of the liquid to be pumped.
2. Quantity to be pumped per minute.
3. Total head to be pumped against.

Nature of the Liquid to be Pumped

As regards the nature of the liquid to be pumped, this may be anything from plain cold water to a liquid which is very hot or cold, highly viscous, or one containing a large amount of solid matter in suspension. Again it may be highly corrosive, or perhaps one to be used for food or other purpose where contamination by the material of which the pump is made must be avoided. The specification should therefore state what the liquid is, and where necessary its specific gravity, temperature, viscosity, and the amount of solid matter in suspension, together with any special requirements regarding absence of contamination or resistance to corrosion. In the case of liquids containing much solid matter it is usually desirable to submit a sample to the pump manufacturer. One very important point to remember is that, if the nature of the liquid is liable to vary from time to time in any of the above particulars, the range of variation should be stated, and that it is not sufficient merely to give an average figure.

The quantity to be pumped in a given time presents no difficulty. The next question is the total head to be pumped against. First, there is the suction side to be considered; will the suction always be "drowned," i.e., fed from an overhead tank or supply, or if not what is the "lift" from the level of the liquid in the supply tank to the pump inlet in feet? If the lift may vary from time to time this should be stated, since, if the liquid is being drawn from a deep tank which may range from full to empty, and the delivery head is small, this variation may affect the total head considerably. If the supply level is above the pump the lift is regarded as negative.

Next there is the "static" head, i.e., the vertical height in feet from the pump outlet to the point of delivery, and finally the "friction" head, i.e., the pressure (in terms of feet of head) required to force the liquid through the suction and delivery pipes. Since pump calculations are always based on water, for other liquids the lift and static heads must be multiplied by the specific gravity of the liquid, and the friction head by the viscosity, taking the viscosity of water as unity. The "total" head is, of course, the algebraic sum of the lift, the static and the friction heads.

It is not infrequently necessary for a pump to deliver at several different levels, for instance to tanks on the second and third floors of a building. If this is the case the heads must be given for each point of delivery, and it should be stated in the specification whether a variable speed motor is required to deal with this condition, or whether throttling by a valve on the delivery line will be used to reduce the delivery at the lower head. One or other expedient is necessary, otherwise the quantity delivered by the pump at the lower head may be so great as to overload the motor to a serious extent.

Type, Fittings and Accessories

Having specified the performance required, the particular type of plant wanted is stated; for example a horizontally split casing may be called for, or it may be that a vertical spindle pump is required. The desired positions of the suction and delivery branches must also be given, e.g., the suction branch to be horizontal on the right side from the motor end, and the delivery branch vertical. There should follow a list of the fittings and accessories which are to be included in the quotation, for instance, footvalve and strainer, priming cock and funnel, a plug or cock for draining the casing, eyebolts for lifting pump and motor, holding-down bolts for the bedplate, a starter for the motor, with or without an ammeter.

Next should be stated whether it is merely desired for the plant to be delivered to stores, or whether erection is to be included for. In the latter case it is specified that the set is to be lined up, levelled, properly grouted in on a prepared foundation, and left ready for running. It is well to state whether the plant is to be on the ground floor or otherwise, if, as is often the case in a new factory, the contractor has to make his own arrangements for getting the plant on to its foundations.

A specification has now been drawn up which is complete in that it is sufficient to enable the manufacturer to offer what he considers to be the most suitable plant for the inquirer's needs from his standard range of types, but his hands have

not been tied in any way; it can now be left to him, as a reputable firm with a long specialised experience in the manufacture of this particular kind of plant, to give a good job In many cases that is sufficient. The inquirer can, and generally does, protect himself by calling for tests and guarantees. It is well to ask for a set of characteristic curves of the pump offered. From these it can be seen whether the point representing the conditions of head, volume, and pump speed fall within the limits of high efficiency, and also whether it lies on a stable part of the head-volume curve. They also enable a better comparison to be made of the technical value offered by the different manufacturers in relation to price.

Most pump manufacturers now test at their own works every pump they make for quantity delivered against the stated head, and for power consumption, but obviously they can only use water, and in case of a difficult liquid, such as a very viscous one, or one containing much solid matter, it is best to call for tests after erection under actual working conditions, and to make acceptance of the plant subject to the satisfactory result of these tests.

Inquirer's Insistence on Certain Features

In some cases it may be necessary to tie the manufacturer's hands in certain respects, though it must be borne in mind that by doing so the price will almost certainly be increased, and very probably the time of delivery if what is required is non-standard. The manufacturer, being up against competition, will, if left free, offer the cheapest plant which he knows will do the job. For instance, he may consider that a casing and impeller of cast iron will meet the requirements as regards freedom from contamination if he tins them where they come in contact with the liquid. The inquirer, however, may prefer to pay more for a better job and specify that these parts are to be made of gunmetal, and since that is rather a vague term, he will say of admiralty gunmetal (88Cu : 10 Sn : 2Zn). He may think it worth while to have a stainless steel shaft, or some particular type of flexible coupling between pump and motor which he has found by experience to give satisfaction. Then on the electrical side he may prefer a totally enclosed or a pipe-ventilated motor to the ordinary open protected or drip-proof types. He may even insist upon a given make of motor or starter to fall in with those standardised throughout the factory, and he may object to a very high speed pump.

When a considerable number of sets are being ordered for a new factory it pays to order the motors separately from the motor manufacturer so as to save the pump maker's profit on them, and the same applies to the starters. The procedure then is to instruct the pump maker to send his half coupling to the motor maker to be fitted to the motor shaft, and instruct the motor maker to send the motor direct to the pump maker for assembly on the combined bedplate. These instructions are incorporated in the specification.

Finally, it may be desired to order spare parts for the set, and if so, a list of these should be given and a separate price asked for.

Each item of these special requirements should be embodied in the specification at the appropriate place. Here they have been dealt with separately in order to emphasise the distinction between them and the minimum information which must be given in all cases even when all the details are left to the manufacturer.

Points to be Specified in Case of Filter Press

All the points mentioned in the above discussion are simple and well known to every engineer, but they have been gone into in detail in order to show that in even the simplest piece of plant there are a great many more points to be considered than might be imagined at a first glance. One more example will be considered, but more briefly: that of a filter press. This may be of iron or other metal, or of wood, and of the plain filtration, simple washing or thorough extraction type. As regards the performance, the total cubic contents of the chambers, say 36 cu. ft. the thickness of the cake, and the nature of the liquid to be filtered are specified. If the latter is at all difficult of filtration a sample should be supplied for test purposes. The volume of liquid necessary to provide a complete charge of the press should be stated, the liquid's specific gravity and temperature, the pressure at which the press will be fed, and whether it will be fed by pump or blow-egg. The weight of the cake per cubic foot should be given and the maximum percentage of liquid which the final cake should contain. Once again, if the composition or physical characteristics of the product to be filtered are liable to vary, the range of this variation should be stated.

A list of the fittings required should be given; sight glasses, compressed air connections (if the cake is to be partially dried by compressed air), non-return valve on the feed connection, blanks for blocking off some of the chambers so as to deal with smaller charges, and so on. The special requirements may call for a particular type of closing gear, mechanical or hydraulic, or a special kind of filter cloth.

To sum up the question of specifications, it has been seen that these should consist of a clear statement of the performance required with full details of the material to be handled or processed, and of the exact conditions under which the plant will have to work, together with any special conditions necessary in each particular case. To ensure that no essential point has been missed involves a good deal of trouble, but this is more than repaid by the saving in time and avoidance of misunderstandings, to say nothing of the risk of purchasing an unsatisfactory plant owing to insufficient information having been given to the manufacturer. Furthermore, once a thoroughly comprehensive specification for a particular kind of plant has been prepared it can be used over and over again and in fact be standardised, the figures and other details being altered to suit any given inquiry.

Before leaving the subject of specifications, it is worth while pointing out that in cases of special plants to be made to the inquirer's own drawings and specifications, it is always a good thing to ask the plant manufacturer to submit an alternative tender based wholly or in part on the nearest standard plant he has to offer. It is then seen how great the technical difference between the specially designed and the standard plants really is, and whether a modification of the standard plant cannot be used with a resultant saving in cost.

Large Scale Ordering

When large quantities of plant have to be ordered, say for a complete new factory, much time and trouble can be saved by preparing a set of printed forms. These may be as follows: Inquiry; Acceptance of Tender: Rejection of Tender; Order Form; and a set of "General Conditions of Contract."

The object of these forms is to set together, once and for all, the whole of the wording which is common to every inquiry and order, leaving very little in each individual case to be typed in on the blanks left on the forms for the purpose, and at the same time standardising the wording and procedure throughout.

Starting first with the General Conditions of Contract, this is prepared on the general lines commonly used for civil engineering contracts, but modified to suit contracts for plant and equipment. The following index from an actual set prepared by the writer will give a good idea of the points to be dealt with, but space forbids a detailed discussion here.

1. Definitions.
2. Inspection of site.
3. Working drawings.
4. Quality of materials and workmanship.
5. Sub-contracts.
6. Inspection and testing during manufacture.
7. Rates of wages and hours of labour.
8. Marketing of material.
9. Notification of dispatch.
10. Work to be under the direction of the engineers.

11. Regulations and by-laws.
12. Storage of materials, tools, etc., on the site.
13. Water, light and power.
14. Inspection and testing during and after erection.
15. Advertisements prohibited.
16. Contractor's responsibility and risk.
17. Compensation of workmen.
18. Liquidated damages for delay.
19. Determination of contract in the event of default.
20. Provisions in case of determination of contract.
21. Maintenance.
22. Terms of payment.
23. Time account work.
24. Arbitration.

The inquiry form asks for tenders for "The Material and/or services described in the attached Specification and Drawings, in accordance with the enclosed General Conditions of Contract, which the Tenderer will be assumed to have accepted." All that has to be typed in is the date, the name and address of the plant manufacturer, the title or brief description of the goods or services, the plant reference number, the date by which tenders must be received, and a note of the enclosures. All other information is contained in the Specification and the General Conditions of Contract.

When it has been decided which tender is to be accepted, the writer has found it more convenient not to send the formal order at once, but to send first an "Acceptance of Tender." This saves time by enabling the manufacturer to make a start with the job right away and order any special materials he may need, and it allows time for making any small modifications which may be required in the tender. It also allows time for the contractor's working drawings to be received, checked, and approved, so that all adjustments of price and technical details have been finally settled when the formal order is sent, and no subsequent alteration should be necessary.

The Special Areas

Record of a Year's Progressive Work

THE latest report* of the Commissioner for the Special Areas (Sir George Gillett) gives a comprehensive description of the industrial position there at the end of September, 1938, and of the work done during the year.

The Commissioner furnishes an apt reply to the criticism sometimes heard that industrialists on a trading estate occupy a privileged position in comparison with already established traders—by reason of concessions in respect of building costs or rent, the cheap provision of water, power, and light; also, in certain cases, an allowance for rates and taxes. Sir George Gillett points out that without such assistance many of the concerns would be unable to get going; most of them are relatively small and would find it difficult to obtain financial support in the ordinary way. The three funds from which assistance is given are the Nuffield Trust, the Special Areas Reconstruction Association, and the Treasury Fund, and in the nature of things these must take greater risks than banks, the ordinary finance house, and the investor would care to assume, or there would be no purpose in the existence of such funds.

The belief that the undertakings established in the trading estates will prove to be successful is one justification for this special method of financing new industry. Another is the fact that this assistance is making it practicable to introduce lighter trades into districts that had been dependent on the heavy industries. By thus spreading the scope of employment it is becoming possible to diminish the distress which follows a depression in the heavy industries. Again, by encouraging industrialists to settle in the less prosperous parts of the country, something is being done to check the unhealthy and dangerous agglomeration of industry and population around London and in southern districts.

On the Trading Estates, of which Team Valley is a good example, the object is ultimately to build up complete self-contained industrial communities with proper housing for their people, roads, lighting, power, convenient access to rail and main roads, and not overlooking provision for recreation, education and the social amenities. At Team Valley a year ago there were twenty-two factories built and ten in course of erection; at the date of the report the comparative figures were seventy-six and nineteen. Similar progress has been made at Treforest in South Wales, this being the only industrial estate in Great Britain providing a high-pressure steam main on which industrialists can draw for a bulk supply of steam for processing and heating purposes. In the various centres there are, in all, about 150 new works and factories in active operation, and a further considerable number are being erected.

* R port of the Commissioner of the Special Areas in England and Wales. H.M. Stationery Office, 2s. net.

Heavy Chemicals Manufacture in India

New Company Sponsored by Tatas and Baroda State can be Foundation of Vast Chemical Industry

CONSIDERABLE interest is being shown by the Government of the State of Baroda in the new chemical company which, as announced in THE CHEMICAL AGE of December 31 last, was launched by Tata and Sons, Ltd., for the purpose of erecting and developing works for the manufacture of heavy chemicals at Port Okha, Baroda. The Government has subscribed a large proportion of the Rs. 5,00,00,000 capital of the new concern and the Dewan of the State, Sir V. T. Krishnamachari, has been appointed one of the first directors. The Okha Salt Works which the new company propose acquiring also owes the success of its development to the interest taken in it by the Government which has always been anxious to develop to the full the industrial resources of the State.

In addition to salt, other raw materials available for the use of the new factory at Okha include lime of high purity.

The idea of developing the basic heavy chemical industry in India had for some time been in the mind of the late Sir Nowroji Saklatvala, and when in England recently, he set up a committee of experts to examine the possibilities of such a scheme. This panel consisted of English, American, Swiss, German, and other experts, who examined the scheme prepared in great detail by Mr. Kapilram H. Vakil.

Mr. Vakil has devoted some years to the study of this subject in Europe and in America, and has a unique knowledge of Indian conditions in the chemical industry. He is an authority on salt and its by-products. Mr. Vakil took his M.Sc. (Tech) degree at Manchester University, and has many connections in this country and in Europe.

The initial programme of the new company will be the development of such products as soda ash and caustic soda, but the further developments will include all heavy chemicals and fertilisers, with the border-line products between the heavy and the fine chemical industry.

The volume of India's trade with foreign countries in industries directly or indirectly dependent on chemical engineering is worth Rs. 25,00,00,000 a year. It will be seen that with the help of the Baroda State, the business resources of Tatas, combined with the technical skill available, this new enterprise, of such importance to India, can be the foundation of a vast chemical industry.

The first directors of the new undertaking are given as Mr. J. R. D. Tata (chairman), Sir Ardeshir Dalal, Sir V. T. Krishnamachari, Dewan of Baroda, Mr. A. D. Schroff, and Mr. Kapilram H. Vakil.

A chlorine liquefying plant with an annual capacity of 4,000 tons is to be built in the near future by the Mo och Domsjö A.-B., of Sweden.

Report of Imperial Institute for 1938

Another Year of Intensive Scientific and Economical Work

ANOTHER year of intensive scientific and economic work is recorded in the annual report for 1938 of the Imperial Institute, South Kensington. Sir Harry Lindsay, the Director, in a foreword points out that Australia has been added to the list of Governments which have resumed contributions to the maintenance of the Institute; that Kenya, Tanganyika and Uganda have increased their contributions; and that Transjordan, Bechuanaland, Basutoland and Swaziland have become new contributors. Two Advisory Councils and the fifteen consultative committees identified with the Institute continue to deal effectively with new scientific and commercial problems. On the plant and animal products side two new committees have sketched the outlines of prospective monographs on gum arabic and vegetable insecticides, and other monographs in contemplation include one on flax production and research in the United Kingdom, and a second on Empire flax supplies. On the mineral resources side monographs on coal, tin, magnesium, bauxite and aluminium, chromite and vanadium are in preparation.

The chapter of the report devoted to the Plant and Animal Products Departments states that its investigation section, which is concerned with the chemical and technical examination of raw materials of plant and animal origin, furnished reports on 457 samples from many parts of the Empire. The number of inquiries dealt with by the intelligence section was 1,253.

Activities of the Mineral Resources Department

The laboratories of the Mineral Resources Department made reports of 117 investigations, involving the examination of 238 samples. The intelligence section of the same department dealt with 1,075 inquiries; these inquiries covered almost every aspect of the mineral industry, but there has been a noticeable increase in those relating to ferro-alloys and the lesser known metals, indicating the greater number of applications which are being found for these metals in industry. A considerable number of inquiries have resulted from the disturbed conditions in several foreign countries, and the consequent necessity for importers to turn their attention to alternative sources of supply of raw materials—for example, tungston ore, iron ore and pyrites.

A number of firms have inquired for Empire sources of supply of vermiculite alternative to that of American and Russian origin already on the market. At present the only known potential sources in the Empire are in the Union of South Africa, Tanganyika and Western Australia. Samples from these localities received at the Imperial Institute seem promising, and a large tonnage is reported to be available in the N.E. Transvaal. Owing to the large margin between the price of the raw material and the current prices for processed products, several concerns are interesting themselves in a project for importing the raw material and processing it in this country. The question of using vermiculite for the same purpose as ground mica in wallpaper printing has also arisen, and samples have been sent to the firm that grinds this class of mica in Britain.

The demand for high-grade quartz crystals both for piezo-electric and optical purposes becomes even more urgent, and inquiries relating to the mineral continue to be received at the Institute. The small amount of good-quality quartz which has come to hand as a result of the efforts made by the Institute and others to stimulate the search for Empire material has done little or nothing to appease the appetite of users of the mineral.

Attention is drawn to the increasing use of rutile, the natural oxide of titanium, as an ingredient in the coating of arc welding rods, and to the large potential supplies available in the monazite-zircon-ilmenite beach sands in many parts of the Empire.

Asphalt-Bitumen-Rubber Mixes

Their Practical Applications in Road Building

IN the course of a paper read at a joint meeting of the London Section of the Institution of the Rubber Industry and the British Rubber Producers' Research Association, in London, on January 23, Mr. Joh A. Plaizier, of the Research Department of the Rubber Foundation, Delft, Netherlands, dealt with the practical applications of the properties of asphalt-bitumen-rubber mixes in road building. In the Netherlands a large number of trial road stretches had been laid during the last five years with the co-operation of governmental and provincial road departments and of several municipal departments of public works. The experimental areas laid up to date and those planned for this year in the Netherlands, could be divided into the following groups:

1. Dressing mixes containing rubber, on asphaltic concrete carpets, containing no rubber.
2. Asphaltic concrete carpets containing rubber throughout the entire thickness of the carpet.
3. Rubber in asphalt-mastic carpets.
4. "Cold" asphalt carpets.

In the first group, difficulties had been experienced in the application of the usual dressing mixes. Their wearing qualities were often poor; usually they produced slippery road surfaces. It had been found that a mixture of sand, filler, road oil and rubber powder applied cold on a newly-laid, still hot, coarse asphaltic concrete carpet produced a well-wearing, non-slippery road surface.

The main reason for adding rubber to the whole aggregate of asphaltic concrete pavements lay in the possibility of the elimination or diminishing of the formation of cracks, which occurred often in this kind of pavement, particularly in some Netherlands cities, where the foundation was not totally rigid, such as those made up of rolled broken bricks. It had been found furthermore that the coefficient of friction was somewhat higher than that of the controls without rubber.

Asphalt-mastic carpets, although no more in use for main highways, were still used to a fairly large extent in city streets, on sidewalks, station platforms, etc. The main objections to this type of carpet were its slipperiness and its softening in hot weather. It was believed that the addition of rubber would greatly diminish this trouble.

"Cold" asphalt was made by the use of a road oil consisting of a fairly hard asphalt cut by the addition of a light oil. To avoid the setting up of costly plant for making hot mixtures when only relatively small areas had to be paved, this type of asphalt had certain advantages.

A New Form of Cane Sugar

Prepared without Detriment to Vitamin Content of Cane Juice Values

SOME details of the manufacture of a new form of cane sugar are described by Kahn (*Food Manufacture*, 1939, *14*, 33). Much of the process, which has been developed in France by Reymond, is kept secret, but the outlines of the manufacture are as follows. The cane juice is stabilised to prevent fermentation in such a way that the vitamin content is not affected. The juice is then evaporated in a form of spray dryer, the temperature being kept low enough to prevent breakdown of vitamins. The sugar emerges from this step as moist, fine crystals, which are moulded into blocks weighing about half-a-pound. These blocks are then dried at a temperature not exceeding 54° C., and then divided into the usual cubes, and packed. The colour of the product is a pale tan, and the taste is almost indistinguishable from that of refined sugar, though there is a slight flavour of brown sugar in it.

It is claimed that the product has the same chemical content as cane juice, with respect to calorific and nutritive value, and vitamin content. Tests have shown that it has not the tendency to cause glycosuria that refined sugar has.

Works Developments of Boots Pure Drug Co., Ltd.

New Extensions at Beeston Visited

THE bringing into regular operation of the new "Drys" building, two chemical process buildings, the new canteen, and the fire station marks a further stage in the long view planning of Messrs. Boots' production departments which the company embarked upon in 1927. A party of representatives of the technical Press, including a representative of THE CHEMICAL AGE visited Beeston on Wednesday and a tour of inspection of the new extensions was made. The Beeston site, situated about four miles from Nottingham, comprises about 275 acres and has adequate transport facilities for both road and rail.

In accordance with the principles originally laid down, all production buildings are planned functionally, their purpose being the main factor in deciding their form. Thus the "Drys" building differs considerably in contour from the "Wets" building, the nature of the processes involved being different, as in the case of the "Wets" building a structure was erected which amounts to a covering for the plant and equipment. This meets the specialised requirements necessary to secure the greatest possible efficiency in production.

The building is constructed in reinforced concrete throughout, and presents several striking features of engineering, one of which is the absence of pillars or supporting columns on the single storey floor area. To accomplish this an interesting feature of design was introduced whereby the ends of the single storey roofs and the multi storey floors are suspended on the cantilever principle from the roof beams, in such a manner that the load is finally transferred to the multi storey columns.

The multi storey is 84 feet wide and 80 feet high and accommodates the manufacturing sections. The raw materials on the third floor feed by gravity the plant on the second and first floors. The manufactured products, in many cases are delivered by hoppers and chutes to meet the packeting materials which converge at the head of the packeting tables provided with conveyor belts, and situated on the ground floor. The warehouse for finished goods is situated at the finishing end of the packeting tables and adjacent to the despatch dock situated on the south side. Throughout, the process of production is designed to flow in the direction north to south, i.e., from the receiving dock on the N. side of the building to the despatch dock on the S. side, and this is the basic cross section system which operates throughout the full 660 feet length of the factory.

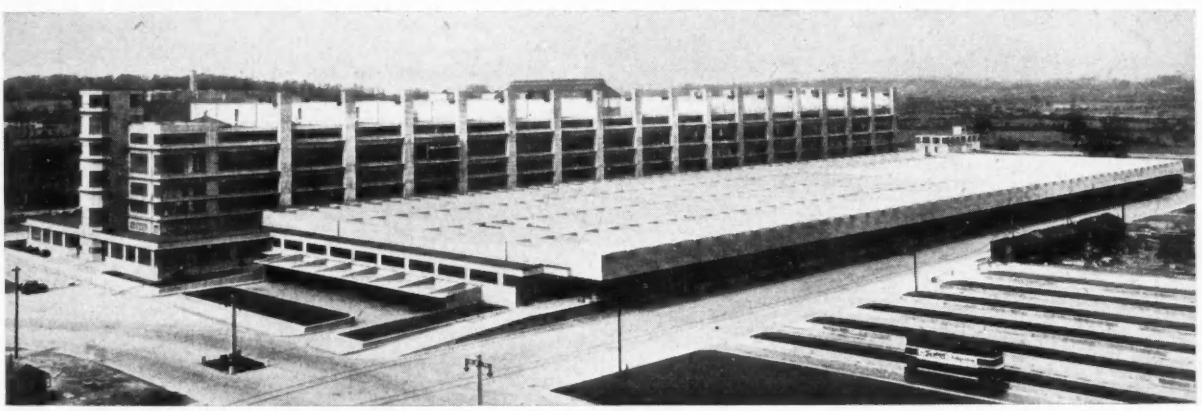
The floors in the manufacturing departments are composed of adamantine chippings laid in cement mortar which is more resistant than ordinary granolithic to organic acids such as tartaric, citric, etc. All internal services such as electric power, electric light, gas, compressed air, vacuum, steam, etc., are supplied from the firm's power house to the sub-basement of the building, via underground cables and pipes. Another interesting feature is the ventilation of the building. Owing to the dusty nature of some of the products, it was necessary to provide an efficient system. To effect this, conditioned air, freed from dust (and heated in winter) is introduced at roof level into the ground floor area.

Wherever possible, totally enclosed filling machines have been installed in the packeting departments to eliminate dust. As an extra precaution in special cases the filling sections have been partitioned off, thereby further localising any dust that may be unavoidably present in the atmosphere. With the ventilation system which has been installed, dust laden air is extracted through the vertical shafts (of which there are 17, each 36 ft. apart) constructed up the side of the multi storey building. Fan units at the top of these shafts create a positive extraction flow to the open air. The heating of the building is carried out by the low pressure hot water system.

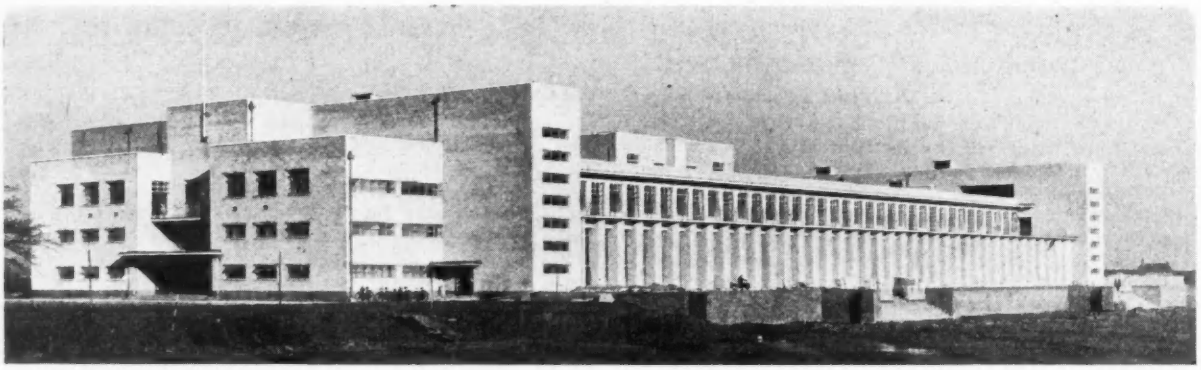
The various operations carried out in the "Drys" building include the reception and storage of the necessary raw materials and packeting materials, as well as the manufacture, packeting, and despatch of such products as powders, tablets, pills, medicated lozenges, pastilles, etc. All raw materials are unloaded on the north dock siding and then stored on the third floor of the building, conveniently for issue as required to the manufacturing sections situated below, on the second and first floors. Packeting materials such as containers, bottles, tins, cartons, envelopes, corks, labels, etc., are also received on the north dock, but stored on the ground floor. Before use, the bottles are washed by two large machines handling all sizes of bottles from 2 drachm to 1 pint. As many as 120 bottles per minutes can be washed and dried on each of the machines.

No less than four separate air-conditioning plants have been installed for use in the preparation of medicated confectionery, effervescent tablets, etc., and for the treatment and cold storage of certain herbs. Thermostatically controlled drying rooms are provided throughout the manufacturing sections, and stainless steel pans and utensils are in general use. The latest type of drug grinding plant is installed, capable of grinding 2 tons of material per day, and a separate building apart from the main factory has been equipped with high speed disintegrators for the rapid grinding of certain materials such as derris root, liquorice, etc. Special rooms are set aside for the handling of obnoxious materials, such as cleaning powder, sulphur, toilet powders, and coloured products.

The packeting hall runs the whole length of the building,



A view of the new "Drys" building at the Beeston works of Boots Pure Drug Co. Ltd.



The canteen, including recreation rooms, school, etc.

a distance of over 600 ft., and is 72 ft. in width. It accommodates 55 packeting tables each 50 ft. long and provided with conveyor belts, on each side of which, girl employees are seated and engaged in filling and packeting the products already referred to. The materials to be packed are manufactured on the floors immediately above, and in some cases are conveyed direct to the packeting table through chutes. Automatic machines are installed for filling such materials as toilet powders, veterinary powders, Epsom and Glauber salts, sodium bicarbonate, boric acid, etc. The automatic equipment for filling 4 oz. cartons of Epsom salts and Glauber salts is particularly interesting, the crystals being fed through hoppers from the floor above. The machine makes up the carton with liner inside, fills and seals the packages at the rate of 60 cartons per minute. At another table, as much as 20 tons per day of cattle Epsom salts can be filled.

As the finished packages leave the packeting tables, they are piled on stands ready for transport by multi truck to the finished stock warehouses, which are conveniently situated on the south side of the building. Branch orders are assembled on wheeled trolleys, checked over and passed to the case packing section. When the goods have been packed, the cases are placed on a slat conveyor at floor level and are conveyed without further handling to the point where they are required to be loaded for despatch by road or rail. This conveyor is a travelling band which covers a total distance of 1,150 ft., i.e., almost twice the length of the building, first through the case packing section and then back along the loading dock. An automatic weighing platform is included in a section of the conveyor so that cases can be weighed and consigned en route.

In addition to the main analytical laboratory which employs 75 chemists and is situated in the "Wets" building, there is a section in the "Drys" building for controlling work in the "process" stage. All raw materials used in manufacture as well as finished goods sent to the warehouse must bear the analyst's "passed" label. In the same way standards are fixed for controlling deliveries of all materials used in packeting operations.

Chemical process buildings providing accommodation for the manufacture of aspirin, potassium permanganate, salts of quinine, bismuth, magnesium, etc., and the firm's horticultural specialities Sulsol and Bouisol, have been built and brought into operation. There are two buildings each constructed in reinforced concrete with drainage channels and pipes of acid-resisting materials. The flooring is granolithic except in special areas where blue bricks jointed in acid-resisting mastic are provided to withstand spillage of acids.

External canopies extend the full length of the building on each side, giving protection to processes carried out in the open air, such as the obnoxious process of making bismuth nitrate. All service pipes are accommodated under these canopies. Flame proof electric motors and fittings are used throughout and as an extra precaution against fire risks in special cases where inflammable solvents are used (as in the manufacture of aspirin) the whole of the electrical equipment including both lights and switches has been installed under the canopies outside the building. The length of each building is 264 ft., the width 72 ft., and the height 26 ft. 6 in. clear at the sides and 36 ft. at the centre of the pitched roof. Each of the buildings has an area of 25,500 sq. ft., and an internal capacity of 850,000 cu. ft.

Apart from the complete installation of automatic sprinklers throughout the factories by the Atlas Sprinkler Co., Messrs. Boots have recently erected a fire station in a position conveniently situated to meet any emergency calls. It consists of a reinforced concrete building housing a fire engine, the usual mobile appliances and other fire fighting equipment, together with the latest A.R.P. requisites.

In addition to the factories already referred to, the company has provided special amenities for their employees, of which there are nearly 3,000 engaged at the Beeston works. These include cycle sheds, parking places for motorists and service buses, and a large canteen. Six concrete sheds capable of accommodating 700 cycles have been specially constructed so that in an emergency they can be utilised as splinter-proof air raid shelters.

The canteen is so situated that it will occupy a central position when the site is completely developed. A recreation area of about 40 acres is being developed around it. In the main it is a two storey building rectangular in shape, 400 ft. long and 160 ft. wide, comprising kitchen and main canteen on the ground floor and service canteen and recreation rooms above. There is a three storey facade at either end, housing in one end, the entrance and crush halls, bathrooms and reception rooms, and in the other the school. The day continuation school, initiated under the Fisher Education Act of 1918, takes some 800 pupils composed of boys and girls of mainly 14 to 16 years of age.

NEW ASSOCIATES OF THE INSTITUTE OF CHEMISTRY

In connection with the January examinations in General Chemistry for the Associateship of the Institute of Chemistry the following pass list has been announced: H. F. Bamford, B.A. (Cantab), C. F. Buckley, B.Sc. (Lond.), K. Burrow, F. S. Clements, R. L. Derry, D. J. Emery, B.Sc. (Lond.), K. G. Fiegenheim, B.Sc. (Lond.), W. J. C. Field, D. Friend, B.Sc. (Lond.), L. Haddock, B.Sc. (Lond.), H. L. Jordan, R. Lockyer, B.Sc. (Lond.), C. J. Lyon, L. C. MacMahon, P. R. C. Pyle, W. R. Smith, B.Sc. (Lond.), T. A. R. Southern, B.Sc. (Lond.), J. G. Spencer, H. E. Stagg, R. G. Stone, B.Sc. (Lond.), B. Tromans, C. H. Wordsworth, B.Sc. (Lond.).

IT IS PLANNED TO ENCOURAGE THE DEVELOPMENT of the synthetic rubber industry by making it compulsory to include a small proportion of synthetic rubber in all rubber-containing products. During the first quarter of 1939, reports the Gazeta Handlowa, rubber factories must incorporate 1.5 kilos synthetic rubber with each 100 kilos imported rubber.

The Chemist in the Power Station

Chemical Problems in Electricity Generation—Need for Men of Specialised Training

AT a meeting of the London Local Technical Group of the Electrical Power Engineers' Association, held at Caxton Hall, London, S.W.1, on January 24, Mr. G. W. Hewson, F.I.C., M.I.Chem.E., and Mr. R. Ll. Rees, M.A., F.I.C., A.M.I.Chem.E., presented a paper in which they discussed the functions of the chemist in the generating station. Having pointed out that the changes of energy that usually accompanied chemical reactions were a part of chemical study, the authors gave examples of the many reactions that were continuously in progress in a power station, such as the burning of coal, and the changes occurring in flue gases, refractories, metals and oils. Analysis provided the measurements for watching and controlling those processes. Analysis was to the chemist what readings of instruments were to the engineer; its results were not always easy to interpret and considerable experience was sometimes needed to judge their meaning correctly.

It was possible in theory, said the authors, to train someone, a chemical engineer, who would combine in one individual the ability and experience needed, firstly to understand the chemistry of the process and to interpret and apply the analyst's reports, and secondly, to supervise the engineering features of operation and maintenance. But the mental outlooks of a power station engineer were very different, and must be so if each were to fulfil his functions in the best and most expeditious manner. That was one of the several cogent reasons why unified control of that kind would be a hazardous undertaking, especially in the larger power stations. It was much better in those circumstances that the chemist and engineer should be separate individuals, each with authority to decide for himself in his own sphere. The closest co-operation between them was essential; therefore, each must know something of the other's subject and appreciate the other's point of view.

Errors In Coal Sampling

Discussing modern methods of coal sampling and the determination of calorific value, the authors said that errors were introduced at every stage—in the taking of the sample, its subdivision to laboratory size, and the measurement of moisture and calorific value. It seemed that the "probable error" of the whole process of determining the calorific value of a consignment of coal was approximately ± 0.25 per cent. when the greatest care was taken; there was a corresponding chance of about 100 to 1 that the result would be within ± 1 per cent. of the true value of the consignment. That appeared to be the highest degree of precision that could be expected in careful industrial work.

In connection with the chemical aspects of combustion of coal on mechanical stokers, stress was laid on the desirability of using secondary air. The efficient combustion that could be obtained with modern equipment was illustrated by the heat balance of a boiler trial, in which a gross thermal efficiency of 91.00 per cent. was obtained, and it was emphasised that careful supervision of the composition of the flue gases was necessary to ensure such results.

The width of the lanes in the fuel bed through which air might pass, relative to the depth of the burning fuel, was important. No operating engineer wanted to restrict himself to the one class of coal and depth of fuel bed which would produce lanes of the right size. Secondary air equipment should be included among the auxiliaries of every boiler which pretended to high efficiency. It was essential that there should be proper control of the primary air if secondary air was to be used to full advantage. When both were used correctly, the total supply of air should be less than when primary air was used alone. Since the amount of primary air required for the fuel bed diminished with the distance down the grate, and since the fuel bed was simultaneously becoming thinner and offering less resistance to the air flow, compartments should be fitted to control the supply of air through the fuel bed at various stages, for maximum efficiency and flexibility of operation.

Many analyses were reported incorrectly, said the authors, in order to make them appear intelligible to the non-chemical mind; but the clarity was only skin deep. They should be either accompanied by a warning of their limitations or expressed correctly and explained in an addendum. Several popular methods of writing water analyses were unsatisfactory, so much so that sometimes they had no meaning to another chemist until the arbitrary basis of reporting them had been defined. The analyst should be encouraged to follow his natural inclination to express his results as he found them, without making assumptions that were intended to render them more generally understandable but which had quite the opposite effect.

Avoid Continuous Chemical Additions To Feed Water

In a discussion of some general aspects of the problems of treating feed water and boiler water, it was pointed out that if care were taken in the operation of a properly designed closed-feed system, it was possible to avoid the continuous addition of chemicals to the feed water and thus, by virtue of very low boiler concentrations, to evade any trouble from carry-over, and to save heat that would otherwise be lost in boiler blow-down, which might amount to 0.5 per cent. of the heat in the coal fired. Constant attention to detail was essential with that method of operation. It had been used successfully in plant working at 600 lb. per sq. in. pressure, the pH of the feed water being 7.3, its oxygen content 0.01 c.c. per litre or less, and its specific conductivity about 0.5 "Dionic" units.

In regard to some of the chemical principles of boiler design, it was urged that the circulating system of a boiler should be so designed that the water in one part of the system was not very different from that in other parts; or failing that, separate "doping" connections and sampling points should be fitted wherever it was possible for the water to have a composition differing from that existing elsewhere. It was impossible to treat the water in a group of boilers properly by adding reagents to a feed line common to them all; each boiler needed individual treatment.

Every item of plant which contained water, or which might contain water, was better arranged so that it could be completely drained by gravity; if that were not done, there might be danger of corrosion in abnormal circumstances, although normal operation was entirely satisfactory. Metals of different composition, or metal which had undergone different treatments, should not be used in the same structure unless the convenience of doing so was great enough to outweigh the danger of corrosion.

Other causes of corrosion in boilers were discussed, and the authors emphasised that, as corrosion was apt to meet less resistance once it had started, everything possible should be done to delay its start, particularly in the early days of a boiler's life. High-pressure boilers were more susceptible to corrosion than the lower-pressure units, in which latter a certain amount of scale might be tolerated. The treatment high-pressure boilers should receive when they were called on to withstand the trying conditions of nightly banking and frequent "outsize" required serious consideration.

DISCUSSION

THE CHAIRMAN (MR. L. MORTON) asked what were the most reliable points for securing samples of coal for power station practice, and the best position in the furnace for the effective

use of secondary air, and whether the type of stoker and firing influenced the proportions of secondary and primary air necessary. His own opinion was that the number of air paths under control on the stoker had a distinct bearing on the amount of secondary air necessary. Discussing fuel damping, he said that the evaporation of the moisture, with consequent increase of egress paths through the fuel, made possible a reduction of excess air, better ash conditions and higher furnace efficiencies, with very considerable reductions in maintenance costs. He asked for the authors' experience as to the best position for fuel wetting. With regard to instruments, he asked whether it would be logical to control combustion from a knowledge of the unburnt gas content of the flue gases, and to regulate the air supply to the furnace according to an indication of the completeness of combustion.

MR. R. LL. REES replied that the most reliable point for the sampling of coal was as near as possible to the point of weighing. It was often the custom to take two samples, one for water and another for calorific value; a good plan was to take one sample where the coal was delivered, and another as it was shot into the bunkers, because by comparing the two there was a check on the constant error of sampling. The best position for injecting secondary air into the furnace, and the quantity which should be injected, depended entirely on the dimensions of the combustion chamber and the methods of firing, as well as the thickness of the fuel bed, because more CO came from thick beds than from thin beds, and there was greater need for secondary air. He imagined that the best position for wetting coal was as early as possible in its travel; the bucket conveyor was a good place. It would be well to control combustion by the percentage of unburnt gases, if one could do that, but he did not know of any instrument which was effective for that purpose. One needed to know the percentage of CO to within about 0.02 per cent. in modern plant in order to do that.

Few Chemists Employed

DR. W. FRANCIS said he knew of no industry of comparable size with the electricity generating industry in which fewer chemists were employed or in which the status of the chemist was so low. Properly trained chemists with initiative and experience invariably paid their way. A power station chemist should be an organic chemist, a metallurgist, a fuel technologist, a refractory expert and a good analyst, and must have a considerable amount of common sense and experience. Unfortunately, the training facilities for power station chemists were not looked after very well in this country, and the only University he knew which catered for such men was Sheffield, where they catered for fuel technology. The alternative was to employ a man with an ordinary degree in science. But such a man required a large amount of practical experience before he could pull his weight. A large number of chemists were men who had graduated from the works by reason of special adaptability or intelligence, and had had to train at evening schools and technical colleges. In London there was no technical college having a course suitable for training chemists directly for power stations; the nearest approach was the Sir John Cass Institute, having a course which admittedly embraced fuel technology, but it was designed to train people for the gas industry.

There had been a very general tendency for the industry to rely on the laboratories of outside contractors and consultants for advice. That was a retrograde step because there should be someone in the organisations who could obtain the data required, and record it. The Central Electricity Board was equally guilty in that respect, because it had a number of chemical problems to investigate and had no chemists on its staff. It simply farmed out its problems. There was no organisation looking after the interests and welfare of the power station chemists particularly, and he suggested there was room for a chemical section inside the Electrical Power Engineers' Association. Finally, he complained that advertisers asked for trained and experienced chemists at salaries of £250 or £260 or less per annum, whereas one could only expect mediocrity or inexperience for such salaries.

MR. REES suggested that probably the nearest existing organisation which covered to some extent the scope of the power station chemist was the Institution of Chemical Engineers. There was an enormous amount of chemical engineering in power station work, but the power station chemist was very badly catered for generally.

MR. J. M. EDMONDS said there were some very excellent evening classes at the Northern Polytechnic, in London, covering fuel technology, and extending over two or three years. That organisation seemed to specialise in power station chemistry.

Resistance of Glass Containers to Thermal Shock

Papers at Society of Glass Technology Meeting

AT the 199th meeting of the Society of Glass Technology, held in University College, London, the President, Dr. C. J. Peddle, in the chair, two papers were presented and discussed, of which the following are abstracts.

Some Notes on the Variation with Temperature Range of the Resistance of Glass Containers to Thermal Shock. By Donald Robertson, B.Sc.Tech., F.S.G.T.

It was almost a universal practice among glass bottle manufacturers to submit the ware they produced to some form or forms of physical test to determine its relative suitability for the purpose for which it was to be used, and to ensure that such quality would continue during production. Such tests were generally evolved from a consideration of the conditions through which any particular glass article would be required to pass during service.

From tests carried out by the author it was concluded (1) that the resistance of a glass container to thermal "downwards" shock decreased with increasing temperature; (2) that with "downwards" thermal shock tests (a) the higher the temperature zone, the greater the breakage for the same temperature difference between the hot and cold baths; and (b) the shorter the time taken in transferring test-ware from the hot bath to the cold, the greater the breakage; (3) that for special conditions of service, tests carried out in, say, the 95°-40° C. zone were more informative and useful than tests in the 70°-15° C. zone—the 95°-40° zone being suggested because tests carried out with a hot bath at 100° C. were "messy."

Seed in Glass Melted in Tank Furnaces. By J. B. Murgatroyd, B.A.

The author discussed the subject of seed, boil and blisters in glass. Possible sources of seed were (1) gases resulting from the melting batch, (2) entrapped air in the batch, (3) gases from porous refractory materials.

Possible sources of boil were (1) dissolved gases coming out of solution, (2) reaction between glass constituents, (3) reaction between glass and either some agent in the refractories or some foreign matter. In carbon amber glasses there was strong tendency to boil when reheated, not necessarily to a higher temperature than that of original melting, and the boil might be associated with reaction between the carbon and residual sulphate.

In the case of seed, the author considered that reaction between batch constituents was the least likely course; for quite small particles of batch gave rise to large bubbles of carbon dioxide. Entrapped air and moisture were regarded as the most likely sources of small seed, and the author's calculations revealed the possibility of introducing about 1,000 seeds of 0.08 m.m. diameter into 1 c.c. of glass, and a still greater number of small seeds. Even a fairly dense, well-fired refractory might be the source of seed in glass, with the possibility of introducing 280 seeds of 0.075 m.m. diameter into 1 c.c. of glass, and possibly others from pores of smaller diameter. The risk was particularly increased when refractories of fairly high porosity were employed at the working end of a tank furnace.

The author set out his methods of calculation and his procedure for determining seeds in glass.

Floors for Factories

Choice of Material for Use in Different Industrial Conditions

LECTURING on floors for industrial purposes before a joint meeting of the Institution of Structural Engineers and the Institution of Chemical Engineers, Mr. R. Fitzmaurice and Dr. Lea, of the Building Research Station of the Department of Scientific and Industrial Research, said that nearly all the failures of floors reported to the Building Research Station were due to corrosion in one way or another. The corrosion of reinforcement in floors had on occasion caused dangerous conditions, and in some cases it had led to the demolition of whole buildings. In a margarine factory, for example, the trouble had arisen through washing porous concrete with well water which was slightly salt.

The requirements of a good floor for an industrial building include resistance to wear and abrasion and resistance to chemical attack by substances coming into contact with the floor. In addition, changes in volume, in particular, shrinkage cracks produced in drying, must be avoided and for the sake of comfort, the floor should not be too hard, or too cold, slippery or noisy and should also look well and be easy to clean.

To resist very severe abrasion, paving brick, dense concrete, or heavy asphalt, reinforced with steel or iron grids were often used. Dust was highly objectionable in certain trades, for example, in painting shops and in food manufacture. Concrete floors were liable to be dusty unless suitably treated. As regards wear, the factory truck was a serious problem and the authors wondered whether trucks fitted with steel wheels and with no provision for steering were really essential. The use of rubber tyres, with ball bearings and some means of steering, would economise in human effort, would be quieter in service and, above all, would reduce wear on floors very greatly.

Turning to chemical attack, the authors pointed out that there were chemical substances which gave trouble with concrete floors but which attacked the concrete so slowly that they could be successfully stored in concrete tanks. The explanation was that when abrasion is absent the attack may be limited to the surface and, though this causes softening, the continuation of the reaction is greatly retarded by the surface products. In the case of floors, however, any such softened surface layer is removed by abrasion, if the conditions of wear are heavy, and the action proceeds more deeply into the concrete. It is indeed the combination of very heavy wear with chemical attack in such cases that often makes the provision of durable floors difficult unless recourse is had to the expensive specialist materials.

At the outset the authors said that no attention would be given to floors in what might be termed purely chemical industries but that this restriction would not be entirely rigid for in the discussion of chemical attack on flooring materials some of the manufacturing processes mentioned might well be regarded as coming under the term "chemical industry." Thus, dealing with the merits of various floors for different types of factories, they said that in cheese factories, dairies, etc., where destructive agents were mainly organic acids and fats, and abrasion was caused by the rolling of heavy churns, the best construction appeared to be a hard acid resistant granitic asphalt mastic with cast iron grids laid to form paths for churns; the provision of rubber mats at unloading points reduced wear, and was reported to prolong the life of the churns.

In factories handling animal and vegetable fats or sugar, jams or fruit juices, quarry tiles with a thin neat Portland cement joint or "blue bricks" set in and jointed with aluminous cement mortar might be suggested. "In general," the authors continued, "timber floors are themselves unlikely to be attacked chemically, but will absorb fats, etc.,

(*Continued at foot of next column.*)

Letters to the Editor

The Five Day Week

SIR,—This firm, which was established in 1861, introduced the five day week as an experiment in 1934 without any corresponding loss of earnings to the staff. We work a 40-hour five day week and this has been a complete success. A happier, healthier and more efficient staff has been created, and we can see no reason why we should return to the old six day working week.

We are proud of our staff, and we like to look upon our workers, not as employees, but as members of a happy family. That we have succeeded in our efforts to make them happy is evidenced by the fact that many of them have been with us for a lifetime; some of them have followed their fathers, who worked for us in Victorian days.

Conditions in our model factory are modern in comfort and cheerfulness. On the social side, we have a staff luncheon and rest room, a camp in the country, a tennis club, a girls' club, a savings fund, life insurance for every married man, a contributory pension scheme, and many other social amenities. We look upon these "aids to happiness" as the very least that is due to a loyal staff.

A brass plate at the entrance to our works invites visitors at any time to "come in and look round." This, so far as we know, is the only factory in this country which is operated on the "ever-open door" principle. That is, anyone can inspect the whole of the factory at any time, with or without a guide.—Yours faithfully,

JOSEPH LINGFORD AND SON, LTD.
Baking Powder Manufacturers,
Bishop Auckland, Co. Durham.

OXIDE FILM PROTECTION FOR ALUMINIUM CHEMICAL PLANT

According to H. Röhrig and L. Lux (*Chem. Apparatur, 25,* 241) the uniform growth of oxide films as produced on aluminium by anodic oxidation is subject to interference from silicon and iron impurities in the aluminium. Impurities obtained in the process of rolling the sheet, such as carbonised particles of oil, are also detrimental. These factors must be borne in mind when specifying aluminium metal to be used ultimately in the making of plant which is to receive anodic treatment before being put into service.

(*Continued from previous column.*)

and be liable to become very slippery and unhygienic. Special treatments are now available for sealing the surfaces of floors which may be found to give a non-slippery finish. In view of the relative immunity of timber from chemical destruction the possibility of using surface treated maple flooring would seem to be worth exploring. Timber has the great advantage over many other types of floor that a worn section can be replaced with greater ease."

In many places, such as bacon, hide tanning and curing factories, the washing water contains salt. It is thus necessary to protect a reinforced concrete sub-floor by an impermeable surface, such as asphalt.

As regards surface noise, as opposed to the transmission of noise through floors, the authors stated, that it might be assumed that the resilience of the surface was the main factor in reducing noisiness in floors. The only satisfactory method of dealing with the transmission of noises, such as footsteps through a floor, was to float the floor surface or dissociate it from the structure with some resilient material.

The authors said that there were no scientific data on the slipperiness of various floors and that there was room here for investigation. In oiling or waxing a floor, it was difficult to find a treatment to bind the surface without the floor becoming too slippery. The ideal would be a non-slip polish, if one could be found.

Personal Notes

MR. H. L. THOMPSON has been elected to the board of Associated British Maltsters, Ltd.

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MR. W. ELLES-HILL has become a director of the Saturn Oxygen Co., Ltd., in place of the late Mr. Sidney Allen.

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LORD CADMAN occupied the chair at the annual dinner of the Durham University Society held at the Florence Restaurant, London, last week.

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MR. PHILIP ERNEST HILL, chairman of Beechams Pills, Ltd., has been elected chairman of Eno Proprietaries, Ltd., and MR. J. S. HOLMES, managing director of Beechams Pills, has been appointed vice-chairman. Beechams Pills recently offered to acquire the whole of the issued ordinary capital of Eno Proprietaries, the offer being accepted by holders of more than 90 per cent. of the shares.

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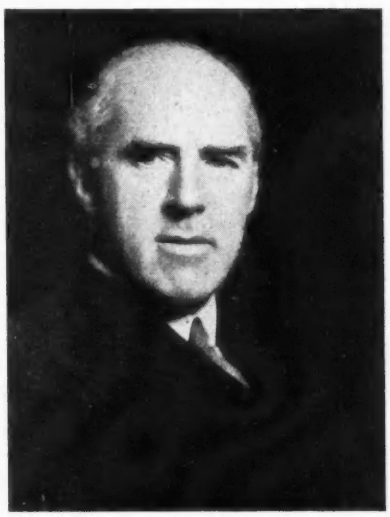
MR. EDWIN THOMPSON, J.P., Governing Director of Manesty Machines, Ltd., and Thompson and Capper Wholesale Ltd., Liverpool, is sailing for South Africa on a business visit in the "Warwick Castle" leaving Southampton on



February 9. Mr. Edwin Thompson was Lord Mayor of Liverpool in 1930/1931, President of the British Waterworks Association in 1931, and President of the Society of Chemical Industry in 1935. He will stay in Capetown, Johannesburg and Durban during his visit.

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PROFESSOR G. INGLE FINCH, Professor of Applied Physical Chemistry in the Imperial College of Science and Technology, was presented at the Belgium Embassy last week with the order of Commander of the Order of King Leopold II, which has been conferred on him by King Leopold III for services rendered to science in Belgium during his term of office as Fondation Francqui professor in the University of Brussels during 1937-1938.

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DR. H. J. T. ELLINGHAM is resigning from the office of honorary secretary of the Chemical Society it was announced at a meeting of the Society last week. The Council of the Society has nominated PROF. G. M. BENNETT as honorary secretary and MR. F. P. DUNN as treasurer, for election at the annual general meeting on March 30. The Council has also accepted with regret the resignations of PROF. F. CHALLENGER and DR. S. GLASSTONE from the office of local representative for Leeds and Sheffield respectively, and has invited DR. J. W. BAKER (Leeds) and SIR A. W. CHAPMAN (Sheffield) to fill these vacancies.

SIR ALWIN R. DICKINSON has been appointed chairman of the board of J. C. and J. Field, soap and candle manufacturers.

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SIR WALTER BENTON JONES, chairman of the United Steel Companies, Ltd., will be the chief guest at the annual dinner of the Rotherham Chamber of Commerce on March 24.

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MR. FLEMING, senr., and MR. FIELD have resigned from the board of Follows and Bate, Ltd., paint-making machinery manufacturers, Manchester, in order to make way for Mr. Fleming, junr., as works manager, and Mr. F. J. A. Toft, as commercial manager.

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MR. R. G. BLAKE, deputy chairman of the Sheffield Gas Co., managing director of Stephenson, Blake and Co., and a director of Kayser, Ellison and Co., has been appointed a director of the Staveley Coal and Iron Co., in place of the late Mr. Robert Whitehead.

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DR. W. T. J. MORGAN has been appointed to the London University Readership in Biochemistry tenable at the Lister Institute of Preventive Medicine. Since 1929 he has been Biochemist and First Assistant in the Serum Department of the Institute at Elstree.

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MR. W. S. B. BOSANQUET, who was until 1936 general manager of the Skinningrove Iron Co., has accepted an invitation to become chairman and managing director of the company. Mr. Bosanquet has been actively associated with the United Steel Companies recently.

OBITUARY

MR. GEORGE M. CURRIE, for many years chief engineer at Nobel's, Ardeer, died on January 27, aged 73. He retired 10 years ago.

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MR. JOHN MITCHELL, who was widely interested in the production of natural rubber, and was a director of a number of rubber growing companies, died last week.

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MR. WILLIAM MOLONEY, a pioneer in the manufacture of tanning extracts in this country and a director of the Calder and Mersey Extract Co., Ltd., Ditton, died last week at the age of 73.

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DR. ALBERT SAUVEUR, who retired from the Emeritus Professorship of Metallurgy at Harvard University in 1935, has died at Brookline, Massachusetts, at the age of 75. From 1917 to 1919 Dr. Sauveur, who was a native of Belgium, was metallurgical expert to the French Ministry of Munitions.

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DR. JOJI SAKURAI, president of the Japanese Imperial Academy and the leading chemist in Japan, died last week at the age of 81. Dr. Sakurai, who has been posthumously created a baron by the Imperial Court, studied chemistry at London University from 1876 to 1881. He took the degree of Doctor of Science while in London and also that of Doctor of Laws at Glasgow University.

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MR. STEVENSON MACADAM, a well-known public analyst, died at his home at Lasswade, Scotland, last week at the age of 72. Mr. Macadam acted, at one time, as assistant lecturer and demonstrator in chemistry and public health at Surgeons' Hall, Edinburgh, and at various stages of his career was public analyst for the counties of Peebles, Haddington, and the Lothians. He was also analyst for a number of Scottish burghs, including Kinross, Elgin, Dingwall, Cromarty, Lerwick, Tranent, East Linton, Cockenzie, Port Seton, and Prestonpans, besides acting as analyst to many agricultural and dairy associations. He was a Fellow of the Institute of Chemistry and of the Chemical Society.

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Fats, Oils, Waxes

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Action of micro-organisms on oleic acid. Reynolds and Hopkins, *Oil and Soap, 15,* 310-312.

Iodine value of tung oil. Bolton and Williams, *Oil and Soap, 15,* 315-316.

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Reflection and refraction of pigments. Battline, *Paint Oil Chem. Rev., 101,* No. 1, 5-8.

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Storage of perishable foodstuffs in gases. Kaess, *Angew. Chem., 52,* 17-21.

General News——From Week to Week

THE CITY OF DURHAM is to form an industrial development board, for the purpose of attracting new industries to the neighbourhood of the city.

THE DEPARTMENT OF OVERSEAS TRADE announced this week that H.M. Government in the United Kingdom have accepted the invitation of the Italian Government to participate in the Rome Universal Exhibition in 1942.

COURTAULDS, LTD., have decided to reopen their Coventry mill at Leigh (Lancs.) which was closed down at the end of June last. It is expected that the mill will reopen on February 27, and provide work for 200 hands.

RESEARCH ACTIVITIES of Glaxo Laboratories, Ltd., makers of pharmaceutical and other specialised products, Greenford, Middlesex, are to be increased, according to Mr. Alec Nathan, the chairman speaking at the 39th general meeting of Joseph Nathan and Co., Ltd., held in London last week.

A STORE SHED CONTAINING ABOUT THREE HUNDREDWEIGHT OF SODIUM and other chemicals was gutted when fire broke out at the premises of Foundry Services, Ltd., Birmingham, on Monday. Owing to the danger of explosion a general call was issued to Birmingham fire brigade, who, on arrival, confined their efforts to preventing the flames from spreading.

MR. G. B. SPRY, who presided at the annual general meeting of the Seed, Oil, Cake and General Produce Association, Liverpool, of which nearly all the firms in the city engaged in seed crushing and oil cake manufacture, are members, stated that the prices of the commodities which were handled by that Association were already so low that there was no room for a slump, but on the other hand, more chance of improvement.

MR. J. SOWLER, chief chemist of Bell and Sons, Ltd., veterinary chemists of Liverpool, in an address to the Liverpool Section of the British Association of Chemists, discussed the chemical aspects of insecticides and stated that a new insecticide—an aliphatic thiocyanate—had been discovered and was surpassing all old methods of killing insects. The new insecticide was speedy in action, non-poisonous and had a very strong residual action.

THE BIG DRIVE being made this year for an increased beet acreage for Scotland gives indications of success. The Cupar factory is on a five years' probation period, and although it has been stated that this is not a direct threat to its existence, it is proof that the authorities will be closely watching for an expansion of the acreage of recent years, having a five-figure mark in view. Acreage officially returned last year was 7,391, which was only a slight increase on that of 1937.

THE BRITISH STANDARDS INSTITUTION has issued a revised specification (B.S. No. 143-1938) for malleable cast iron and cast copper alloy pipe fittings, and a new specification (B.S. No. 821-1938) for iron castings for gears and gear blanks. With the publication of the former the Institution has completed the revision of the specifications for long sweep malleable iron pipe fittings (B.S. 143-1922) and cast iron pipe fittings (short turn type) (B.S. 154-1922), the two specifications now being incorporated in one publication.

A SPECIAL GRADE of magnesia for the insulation of Pyrotenax electric cable has been manufactured at the works of the Washington Chemical Co., Ltd., during the past year, said Sir Samuel Turner, chairman of Turner and Newall, Ltd., at the annual general meeting of the last-named company held at York on January 26. The Washington Chemical Co., Ltd., which is a subsidiary of Turner and Newall, Ltd., have also introduced a translucent magnesia for use as a filler in translucent rubber.

JOSHUA BIGWOOD & SON, LTD., engineers and ironfounders of Wolverhampton, builders of special purposes machine tools, announce that they have purchased the goodwill, including all drawings, patterns, jigs, tools, records and work in progress of the general purpose lathes made by The Britannia Lathe & Oil Engine Co., Ltd., of Colchester. These lathes range from 4½ in. to 9 in. centres and will, in future, be made at Messrs. Bigwoods' Wednesfield Road Works in Wolverhampton. However, the general design of these machines is being improved, embodying the latest machine tool practice, and special plant and equipment for manufacturing them by the most up-to-date methods will be installed, as found necessary.

THE VICTORIA JUBILEE TECHNICAL INSTITUTE, Bombay, celebrated the golden jubilee of its establishment in December. The event was commemorated with the issue of a golden jubilee booklet which illustrates and describes the history of the Institute.

MR. A. NAESMITH, vice-chairman of the Joint Committee of Cotton Trade Organisations, announced last week that two-thirds of the cotton industry were in favour of the proposed Cotton Industry Enabling Bill, including 93 firms in the finishing section with a turnover value in 1938 of £13,914,756.

AT A RECENT MEETING of the Portsmouth and District Chemical Society, a lecture on processes connected with public water supply was given by Mr. D. H. Thomas, engineer to Portsmouth Waterworks, who explained that *Bacillus Coli* possessed considerable tenacity of life, while at the same time being harmless to humanity. It was therefore regarded as performing a useful function, in that when supply was cleared of *B. Coli* by sterilisation treatment, this was an indication that less sturdy bacilli, *B. Typhosus*, for example, had been completely eliminated. Mr. Thomas also gave details of the Portsmouth chlorination plant and its function in securing water sterility.

CLIFFORD CHRISTOPHERSON AND CO., LTD., have by amicable arrangement relinquished their interest in the distribution of the "Three Elephant" brand boron products. Mr. W. J. Hatchley, who managed their borax department for many years, has resigned his directorship. A recently registered company, Borax and Chemicals, Ltd., Kings Bourne House, High Holborn, London, W.C.1, will take over the business in "Three Elephant" borax—boric acid previously handled by Clifford Christopherson and Co., Ltd. Appointments in Borax and Chemicals, Ltd., are: Mr. W. J. Hatchley, managing director; Mr. H. F. Barnett, sales manager; and Mr. W. C. Steer, secretary.

A PREDICTION THAT THE CALEDONIAN POWER BILL rejected last March by Parliament for the third time, would come up again within three years was made by Mr. Alexander McGregor, a Fort William business man, at a dinner in the town last week. The same view was expressed by Dr. Isaac, of Fort William, who said that even the opponents of the Bill were now regretting the part they had taken. Nothing could stop the scheme for the development of the hydro-electric resources of the district. The scheme, on which it was proposed to spend £3,000,000, would mean much work for 2,000 men during construction and steady employment for 400 men at the factory of the British Aluminium Co.

ACCORDING TO THE F.B.I. BUSINESS BAROMETER, the New Year finds business in very much the same condition as at the end of 1938. Industrial activity and employment have on the whole maintained the moderate levels established last autumn, but the lack of confidence in the political outlook is holding up fresh orders. Trade stocks appear in most cases to have been brought down to reasonable levels so that the underlying condition is much healthier than it was at this time last year. There can be no doubt that if something could be done to restore confidence in the political field, there would be an improvement in world industry and commerce. At the moment, however, international trade shows little, if any, sign of reviving, and, apart from rearmament and defence home trade is marking time with a tendency to move to lower levels.

A COMMITTEE OF ZINC CONSUMERS under the chairmanship of Mr. W. J. U. Woolcock, of Imperial Chemical Industries, Ltd., jointly with a delegation from the Metal Exchange, recently placed objections before the Import Duties Advisory Committee regarding the anticipated new tariff on foreign zinc, details of which will shortly be announced. The scheme for the new duties was first put forward in October, 1938. The original proposals were for an increase from 12s. 6d. to 30s. in the import duty on foreign zinc, and increase from 12s. 6d. to 30s. in the premium for Empire metal. The main object of the scheme was to leave the home market free to Empire producers, and at the same time offer assistance to home refiners. The importers of Empire metal would pay 10s. per ton to the Imperial Smelting Corporation and 5s. per ton into a special pool to subsidise exports. The Imperial Smelting Corporation were also to contribute to the special pool at the rate of 5s. per ton for its own production of zinc.

THE FIRM OF CHANCE BROTHERS, LTD., Glasgow Glass Works, Glasgow, N.W., have been admitted to membership of Glasgow Chamber of Commerce.

A REPRESENTATION has been made to the Board of Trade under Section 10(5) of the Finance Act, 1926, regarding ethyl guaiacol. Any communication should be addressed to the Principal Assistant Secretary, Industries and Manufactures Department, Board of Trade, Great George Street, London, S.W.1, before February 25, 1939.

INFORMATION HAS BEEN RECEIVED from West Calder that surface operations are about to commence at Hermand preparatory to the laying down of a shale mine into the Dunnet shale seam. Two mines, it is stated, are likely to be opened on Baads Estate, and the prospect of a crude oil works being set up near Westwood Pit is also mentioned. It is understood that Scottish Oils, Ltd., with the latter end in view, have purchased Westwood estate.

IT IS ANNOUNCED BY THE DEPARTMENT OF OVERSEAS TRADE that the King and Queen and Queen Mary will pay the following visits to the British Industries Fair, which opens in London and Birmingham on February 20: February 20, Earls Court (morning), The Queen; February 21, Olympia (morning), Queen Mary; February 22, Earls Court (afternoon) Queen Mary; February 23, Olympia (morning), Queen Mary; March 1, Birmingham (afternoon), The King.

LEVER BROS. AND UNILEVER N.V. has established four companies to take over the shareholdings of Anton Jurgens United Factories and the Dutch Association for the Exploitation of Margarine Factories (Hovema), which were wound up last year. The names of the companies, with the capital increased since registration are: Marga (Fl.25,000,000), Saponio (Fl.25,000,000), Wenado (Fl.22,500,000), and Lipoma (Fl.5,000,000). The whole of the shares are held by Lever Bros. and Unilever N.V., and affiliated companies.

Inventions in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Applications for Patents

PROCESSES FOR PURIFYING LIQUID LUBRICANTS, ETC.—M. Armbruster. (Germany, Jan. 13, '38.) 1248.

FIREPROOFING OF CELLULOSE, ETC.—W. W. Bamber. 1536.

PRODUCTION OF GAS, ETC., from liquid fuels.—L. Bell. 1476.

PRODUCTION OF BERYLLIUM ALLOYS.—Beryllium Corporation. (United States, Jan. 14, '38.) 1360; (United States, Nov. 14, '38.) 1361.

COPPER ALLOYS.—H. W. Brownsdon, W. O. Alexander, W. H. Davies, and Imperial Chemical Industries, Ltd. 1268.

MANUFACTURE OF SUBSTANTIVE DYESTUFFS.—A. Carpmael (I. G. Farbenindustrie.) 1502.

PRODUCTION OF AZO DYESTUFFS on the fibre.—Chemical Works, formerly Sandoz. (Switzerland, Jan. 18, '38.) 1625.

MANUFACTURE OF CHEMICAL COMPOUNDS.—Deutsche Gold-und-Silber-Scheideanstalt, vorm. Roessler. (March 31, '38.) (Germany, April 1, '37.) 1483.

MANUFACTURE OF PROTEIN PLASTICS.—J. P. Dickson, and Imperial Chemical Industries, Ltd. 1267.

TREATMENT OF ALIPHATIC ALDEHYDES.—Distillers Co., Ltd., H. L. Maxfield, and W. A. Smart. 1744.

PRODUCTION OF IRON FROM ORE.—F. L. Duffield. 1079.

ACCELERATORS OF VULCANISATION, ETC.—Dunlop Rubber Co., Ltd., D. F. Twiss, and S. R. W. Hale. 1556.

MANUFACTURE OF SURFACE ACTIVE MATERIALS, ETC.—E. I. du Pont de Nemours and Co. (United States, Jan. 13, '38.) 1264.

MANUFACTURE OF DIALKYL ETHERS OF GLYCERINE.—E. I. du Pont de Nemours and Co. (United States, Jan. 13, '38.) 1265.

REDUCTION OF VAT DYESTUFFS.—E. I. du Pont de Nemours and Co., and H. A. Lubs. 1624.

LIGHT ALUMINIUM ALLOYS.—Electrique Association Cooperative d'Ouvriers en Materiel Electrique, and J. Hanco. (France, June 24, '38.) 1023.

MANUFACTURE OF SULPHONAMIDE-ALDEHYDE CONDENSATION PRODUCTS.—Fahlberg-List, A.-G., Chemische Fabriken. (Germany, Jan. 18, '38.) 1752.

PREPARATION OF REDUCTION PRODUCTS OF OESTRONE etherified with a benzyl, etc.—J. F. Fife (Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara R.T. (Dr. Kereszty and Dr. Wolf). (Jan. 11, '38.) 1099.

FATTY ACID DISTILLATION.—Foster Wheeler, Ltd. (Foster Wheeler Corporation). 1585.

METHOD OF RECOVERING SULPHUR DIOXIDE.—M. Guggenheim, S. R. Guggenheim, E. A. C. Smith, and M. G. B. Whelpley. (United States, Jan. 17, '38.) 1467.

PRODUCTION OF OZONE.—H. G. Hoare. 1496.

PROCESS FOR OBTAINING TRUE TANNING SUBSTANCES from sulphite cellulose waste liquors.—H. Honig. 1563.

MANUFACTURE OF WATER-INSOLUBLE AZODYESTUFFS.—I. G. Farbenindustrie. (Germany, Jan. 21, '38.) 1282.

MOTH-PROOFING PREPARATIONS.—I. G. Farbenindustrie. (Germany, Jan. 15, '38.) 1348.

PURIFICATION OF MASSES containing calcium hydroxide.—I. G. Farbenindustrie. (Germany, Jan. 21, '38.) 1469.

MANUFACTURE OF MONOAZO-DYESTUFF SULPHONIC ACIDS.—I. G. Farbenindustrie. (Germany, Jan. 17, '38.) 1501.

MANUFACTURE OF WATER-GLASS CEMENTS resistant to water, etc. I. G. Farbenindustrie. (Germany, Jan. 17, '38.) 1583.

LAMINATED MATERIALS.—Imperial Chemical Industries, Ltd. (United States, Jan. 14, '38.) 1505.

PURIFICATION OF GASES.—International Corporation, Ltd., and A. Ryner. 1278.

METHOD OF PRODUCING CHLORINATED RUBBER, ETC.—L. Mellersh-Jackson. (Hercules Powder Co.). 1239.

MANUFACTURE OF AMINOMETHYLENE ALDEHYDES.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. (Holland, Feb. 22, '38.) 1612.

METHOD OF PREPARING 1-SUBSTITUTED ARYLTHIAZOLES, ETC.—Kodak, Ltd., and B. Beilenson. 1532.

NITRATION OF MALEIC ANHYDRIDE STYRENE RESINS.—Kodak, Ltd., (Eastman Kodak Co.). 1430.

WATERPROOFING LACQUERS, ETC., FOR FLOORS, ETC.—E. Melling, and United Paint Co., Ltd. 1432.

ELECTRODEPOSITION OF PLATINUM METALS.—Mond Nickel Co., Ltd., and R. H. Atkinson. 1618.

ACIDS OF THE ETIOCHOLANE SERIES.—Naamlooze Vennootschap Organon. (Netherlands, Jan. 13, '38.) 1100.

DERIVATIVES OF THE CYCLOPENTANO-DIMETHYL-POLYHYDROPHENANTHRENE SERIES.—Naamlooze Vennootschap Organon. (Netherlands, Jan. 13, '38.) 1101.

PROCESS, ETC., FOR MAKING LUMP CALCIUM CHLORIDE.—L. N. Reddie (Calorider Corporation). 1126.

STABILISED CUPROUS OXIDE.—Rohm and Haas Co. (United States, Feb. 11, '38.) 1193.

PLASTIC COMPOSITIONS.—Rubber Cement Products, Ltd., and R. H. P. Watts. 1329.

PRODUCTION, ETC., OF SOLUTIONS of high molecular sulphur-containing condensation products.—Rutgerswerke, A.-G. (Germany, Jan. 25, '38.) 1787.

PRODUCTION OF PARTICULARLY HIGHLY ACTIVE PREPARATIONS of thyreotropic hormone from anterior lobes of the hypophysis.—Schering, A.-G. (Germany, Jan. 15, '38.) 1346; (Germany, Jan. 17, '38.) 1347.

COLOURING ALUMINIUM, ETC.—Soc. of Chemical Industry in Basle. (Switzerland, Jan. 15, '38.) 1419.

MANUFACTURE OF UREA DERIVATIVES.—Soc. of Chemical Industry in Basle. (Switzerland, Jan. 18, '38.) 1750; (Switzerland, Dec. 19, '38.) 1751.

ESTERIFICATION OF CELLULOSE.—Standard Telephones & Cables, Ltd., A. A. New, D. R. Beckwith, and W. A. Wiltshire. 1757.

BERYLLIUM CHLORIDE.—F. Tench (Richardson). 1363.

TREATMENT OF TEXTILE MATERIALS.—Tootal Broadhurst Lee Co., Ltd., H. Corteen, and R. P. Foulds. 1183.

FINISHING TEXTILE MATERIALS.—Tootal Broadhurst Lee Co., Ltd., H. Corteen, R. P. Foulds, and H. Potter. 1182.

PRODUCTION OF GLAZED FABRICS.—Tootal Broadhurst Lee Co., Ltd., H. Corteen, R. P. Foulds, and F. C. Wood. 1184.

TREATING TEXTILE MATERIALS.—Tootal Broadhurst Lee Co., Ltd., H. Corteen, and J. T. Marsh. 1531.

Complete Specifications Open to Public Inspection

STYRENE POLYMERISATION.—E. I. du Pont de Nemours and Co. July 22, 1937. 31102/37.

PRODUCTION OF HYDROGEN PEROXIDE.—Mathieson Alkali Works. July 22, 1937. 10878/38.

PROCESS FOR THE MANUFACTURE OF ANEURIN.—F. Hoffman-La Roche and Co., A.-G. July 22, 1937. 14957/38.

PRODUCTION OF FOODSTUFFS.—International Patents Development Co. July 17, 1937. 16305/38.

INSECTICIDES.—Rohm and Haas Co. July 23, 1937. 16653/38.

TREATMENT OF CATION-EXCHANGE RESINS.—I. G. Farbenindustrie. July 21, 1937. 19555/38.

WEAR-RESISTANT METAL ALLOY.—F. H. Willey. July 21, 1937. 19881/38.

COATING-COMPOSITIONS.—E. I. du Pont de Nemours and Co. July 17, 1937. 20328/38.

COATING-COMPOSITIONS for producing a dull or matt finish.—E. I. du Pont de Nemours and Co. July 22, 1937. 20329/38.

PROCESS FOR THE MANUFACTURE OF POWDERED GLUTEN from cereals.—Fielder's General Products, Pty., Ltd. July 21, 1937. 20784/38.

Specifications Accepted with Date of Application

OIL-MODIFIED ALKYD RESINS.—S. L. M. Saunders, and Pinchin, Johnson and Co., Ltd. July 8, 1937. 498,818.

MANUFACTURE OF WATER-SOLUBLE MONO-AZO-DYESTUFFS.—W. W. Groves (I. G. Farbenindustrie.) July 12, 1937. 498,878.

MANUFACTURE OF WATER-SOLUBLE AZO-DYESTUFFS.—W. W. Groves (I. G. Farbenindustrie.) July 12, 1937. 498,879.

METHOD OF PREPARING CATALYSTS.—Gas Light and Coke Co., and R. H. Griffith. July 13, 1937. 498,828.

PRODUCTION OF NITROGEN-CONTAINING DYESTUFFS.—Montecatini Soc. Generale per L'Industria, Mineraria, ed Agricola. July 17, 1936. 498,831.

SYNTHETIC RESIN COMPOSITIONS.—A. Hill, and Imperial Chemical Industries, Ltd. July 13, 1937. 498,832.

MANUFACTURE AND PRODUCTION OF VALUABLE LIQUID HYDROCARBONS by polymerisation of olefines.—G. W. Johnson (I. G. Farbenindustrie.) July 15, 1937. 498,526.

MANUFACTURE AND PRODUCTION OF CONCENTRATED NITRIC ACID.—G. W. Johnson (I. G. Farbenindustrie.) July 16, 1937. 498,898.

CARRYING-OUT CATALYTIC DEHYDROGENATION REACTIONS of non-aromatic organic compounds.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. July 20, 1936. 498,859.

PREPARATION OF ALUMINA.—Montecatini Soc. Generale Per L'Industria, Mineraria ed Agricola. July 20, 1936. 498,864.

TREATMENT OF MOLTEN METALS with water-soluble reagents.—A. H. Stevens (National Lead Co.). July 21, 1937. 498,529.

SOAP.—H. A. Couchman. July 22, 1937. 498,692.

MANUFACTURE OF WATER-INSOLUBLE AZO DYESTUFFS on vegetable fibres.—A. Crapmael (I. G. Farbenindustrie.) Aug. 4, 1937. 498,534.

METHOD AND APPARATUS for saturating liquids with carbon dioxide.—N. Meurer. Aug. 26, 1937. 498,536.

MAGNESIUM ALLOY.—G. Von. Giesche's Erben. Aug. 10, 1937. 498,702.

BARBITURIC ACID COMPOUNDS and process of making same.—H. E. Potts (Pola Fabbrica di Prodotti Chimica Soc. Anon.). Nov. 16, 1937. 498,545.

ALLOYS.—J. S. Streicher. Dec. 17, 1937. 498,767.

MANUFACTURE OF SULPHURIC ACID.—W. W. Triggs (Soc. Generale Metallurgique de Hoboken). Dec. 24, 1937. 498,631.

METHOD OF MANUFACTURE OF ALUMINA.—J. C. Seailles. March 6, 1937. 498,569.

MANUFACTURE OF AZO-DYESTUFFS containing metal in complex union.—Soc. of Chemical Industry in Basle. March 13, 1937. 498,575.

ALLOYS AND METHODS OF MANUFACTURING THEM.—General Electric Co., Ltd., and C. J. Smithells. March 23, 1938. 498,791.

ELECTROLYTIC PRODUCTION OF MANGANESE COMPOUNDS.—F. Hochwald. March 28, 1938. 498,793.

PRODUCTION OF STABLE CONCENTRATED SOLUTIONS of the salts of orthoiodohippuric acid.—Naamlooze Vennootschap Orgachemia. June 3, 1937. 498,801.

MANUFACTURE OF DERIVATIVES OF THE DIHYDRO-OESTRINE SERIES. Soc. of Chemical Industry in Basle. Sept. 27, 1937. 498,812.

METHODS AND MEANS FOR THE TREATMENT OF GASES.—Brimsdown Chemical Works, Ltd., and E. Hene. June 7, 1937. 498,734.

PROCESS FOR THE MANUFACTURE OF METALLIC IRON for use as a pharmaceutical preparation.—H. J. W. France (L. von Szebellédy). April 12, 1937. 499,044.

MANUFACTURE AND PRODUCTION OF WETTING AGENTS.—G. W. Johnson (I. G. Farbenindustrie.) April 9, 1937. (Samples furnished.) 499,022.

PRODUCTION OF CRYSTALLINE DEXTROSE.—International Patents Development Co. May 11, 1936. 499,195.

IRON DESULPHURISATION.—R. P. Heuer. Aug. 19, 1936. 499,302.

MANUFACTURE OF POLYMERISATION PRODUCTS.—W. W. Groves (I. G. Farbenindustrie.) June 10, 1937. (Samples furnished.) 499,025.

TREATMENT OF TEXTILE MATERIALS, foils, and the like, derived from cellulose.—H. Dreyfus, and R. W. Moncrieff. June 15, 1937. 499,196.

RECOVERING OIL from Kerogen-containing shale.—J. J. Crawford. June 18, 1937. 499,141.

TREATMENT OF CORN for the production of starch and related products.—International Patents Development Co. Oct. 17, 1936. 499,200.

PRODUCTION AND RECOVERY OF METALS.—Kodak, Ltd. (Eastman Kodak Co.). July 14, 1937. 499,201.

MANUFACTURE OF WETTING AGENTS.—A. Carpmael (I. G. Farbenindustrie. July 14, 1937. (Samples furnished.) 499,203.

MANUFACTURE OF SULPHONATION PRODUCTS.—W. W. Groves (I. G. Farbenindustrie.) July 15, 1937. 499,144.

POLYVINYL ACETAL RESINS.—Kodak, Ltd. (Eastman Kodak Co.). July 15, 1937. 499,146.

PRODUCTION OF DIESEL FUELS by treatment of crude oils with oxygen.—F. Uhde. July 15, 1936. 499,372.

DELUSTRING AND RENDERING TEXTILE FABRICS CREASE-RESISTING. Tootal Broadhurst Lee Co., Ltd., R. P. Foulds, and J. T. Marsh. July 16, 1937. 499,207.

MANUFACTURE OF VINYL METHYL KETONE.—I. G. Farbenindustrie. July 24, 1936. 499,034.

SULPHONATION.—Procter and Gamble Co. Sept. 4, 1936. 499,373.

EXTRACTING PYENOLIC COMPOUNDS from hydrocarbon oils.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. July 21, 1936. 499,312.

MANUFACTURE OF PENTAMETHINE-ω-ALDEHYDE HETEROCYCLIC BASES.—I. G. Farbenindustrie. Aug. 29, 1936. 499,318.

MAKING DISAZO LEATHER DYES.—M. Mendoza, and Imperial Chemical Industries, Ltd. July 21, 1937. 499,322.

PRODUCTION OF PIGMENTED COMPOSITIONS in organic vehicles. E. I. du Pont de Nemours and Co. July 22, 1936. 499,334.

Chemical and Allied Stocks and Shares

THE more reassuring views as to international political affairs have been reflected by a strong recovery of values on the Stock Exchange following the sharp reaction recorded last week. In many cases the improvement has been substantial and recent declines have been fully regained in numerous instances. Subsequently there was a tendency for profit-taking sales to affect prices, but market conditions were more active than for some time past, and sentiment is benefiting from the hope that trade conditions may be stimulated later in the year if uncertainty in regard to international politics is no longer a restrictive influence.

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Securities of chemical and kindred companies participated in the better market tendency. Imperial Chemical are 30s. 4½d. at the time of writing, compared with 29s. 3d. a week ago. The market is taking the view that the dividend for the past year may be 7½ per cent., or possibly 8 per cent., which would compare with 8½ per cent. paid for 1937. Lever and Unilever rallied strongly following the cessation of liquidation from the Continent and are 33s. 9d., compared with 31s. 6d. a week ago. Other shares with an international market also showed good recovery, including Swedish Match and International Nickel. The annual report of the latter company falls to be issued next month.

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Fison, Packard and Prentice were again a very steady feature and have remained at 38s. 9d., while British Oil and Cake Mills preferred ordinary were in better request and made the slightly higher price of 41s. 6d. Various shares which were affected considerably by the reactionary markets in evidence last week have now made substantial improvement. British Aluminium, for instance, are now 53s. 9d., compared with 50s. 9d. a week ago, while Turner and Newall have recovered from 72s. 6d. to 75s. British Oxygen moved up to 67s. 6d. and Murex also moved to a higher price.

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Boots Pure Drug at 39s. 10½d. are 1s. 1½d. higher on balance, while Sangers have been steady at 21s. and Timothy Whites and Taylors improved moderately to 24s. 10½d. Associated Cement moved ahead, and following their decline to 61s. 10½d. last week are now 66s. 3d. The market is not budgeting for the maintenance of the dividend of the latter company at 22½ per cent., but is hopeful that 20 per cent. may be paid. British Plaster Board at 25s. 3d. are 1s. above the price current a week ago. B. Laporte were lower at around 80s., but in this case the price was apparently not tested by business.

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Imperial Smelting, which were assisted by the belief that the decision in regard to the claim for a higher duty on foreign imported zinc may be announced shortly, are 11s. at the time of writing, compared with 9s. 6d. a week ago. Better demand was reported for Borax Consolidated deferred, which were aided by the more hopeful dividend estimates which developed in the market this week, and the shares at 25s. 6d. are fully 2s. higher on balance.

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Triplex Glass responded to the surrounding trend with a rally from 27s. 6d. to 29s. Courtaulds were better at 25s. 6d., although the disposition is to await declaration of the dividend which is expected this month. Calico Printers and most other leading textile shares were moderately better. Dorman Long, Stewarts and Lloyds, Consett Iron and other iron and steel shares have recovered most of the decline experienced last week.

Strong improvement was recorded by leading oil shares, particularly "Shell," Royal Dutch and Anglo-Iranian.

Weekly Prices of British Chemical Products

STEADY conditions have prevailed in most sections of the general chemical market this week and business has been about normal for the period. The movement of chemicals into home consumption is regarded as satisfactory and the volume of export inquiries shows a decided improvement. A steady demand has been maintained for most of the potash and soda compounds and solvents are reported to be in good call. Values on the whole show very little change and quotations continue at recent levels. Some improvement can be recorded in the market for coal tar products. Although long term contract business continues to be scarce buying for spot or near delivery has been proceeding on a good scale. Market quotations are steady with a firm undertone.

MANCHESTER.—Lack of confidence has for some time been having a depressing influence on trade in chemical products on the Manchester market and new business during the past week has mostly been limited to small parcels. The undertone during the past few days has been a trifle brighter, however, and it is hoped that this will eventually react upon the volume of trade. In the aggregate the flow of specifications for contract deliveries has been on a moderate scale. Price changes since last report have been of little consequence. The majority of tar products have been about maintained, with the bulk of the moderate trade passing concerned with light distillates.

GLASGOW.—There has been a steady day-to-day demand for chemicals for home trade during the week but export business remains very quiet. Prices generally continue steady at about last week's figures with no outstanding changes to report.

Price Changes

Falls: Lead, red; Salammoniac, dog-tooth crystals; Sodium Sulphate (Salt Cake) (Manchester); Cresylic Acid, 97/99%; pale, 99/100%; dark, 95%.

General Chemicals

ACETONE.—£39 to £43 per ton, according to quantity.

ACETIC ACID.—Tech, 80%, £30 5s. per ton; pure 80%, £32 5s.; tech., 40%, £15 12s. 6d. to £18 12s. 6d.; tech., 60%, £23 10s. to £25 10s. MANCHESTER: 80%, commercial, £30 5s.; tech. glacial, £42 to £46.

ALUM.—Loose lump, £8 7s. 6d. per ton d/d; GLASGOW: Ground, £10 7s. 6d. per ton; lump, £9 17s. 6d.

ALUMINIUM SULPHATE.—£7 5s. 0d. per ton d/d Lancs. GLASGOW: £7 to £8 ex store.

AMMONIA, ANHYDROUS.—Spot, 1s. to 1s. 1d. per lb. d/d in cylinders. SCOTLAND: 10½d. to 1s. 0½d., containers extra and returnable.

AMMONIA, LIQUID.—SCOTLAND: 80°, 2½d. to 3d. per lb., d/d.

AMMONIUM CARBONATE.—£20 per ton d/d in 5 cwt. casks

AMMONIUM CHLORIDE.—Grey, £17 10s. per ton, d/d U.K. Fine white, 98%, £16 per ton, d/d U.K.

AMMONIUM CHLORIDE (MURIATE).—SCOTLAND: British dog tooth crystals, £32 to £35 per ton carriage paid according to quantity. (See also Salammoniac.)

AMMONIUM DICHROMATE.—8½d. per lb. d/d U.K.

ANTIMONY OXIDE.—£68 per ton.

ARSENIC.—Continental material £11 per ton c.i.f., U.K. ports; Cornish White, £12 5s. to £12 10s. per ton f.o.r., mines, according to quantity. MANCHESTER: White powdered Cornish, £16 per ton, ex store.

BARIUM CHLORIDE.—£11 10s. to £12 10s. per ton in casks ex store. GLASGOW: £12 per ton.

BLEACHING POWDER.—Spot, 35/37%, £9 5s. per ton in casks, special terms for contract. SCOTLAND: £9 5s. per ton net ex store.

BORAX COMMERCIAL.—Granulated, £16 per ton; crystal, £17; powdered, £17 10s.; extra finely powdered, £18 10s., packed in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. GLASGOW: Granulated, £16, crystal, £17; powdered, £17 10s. per ton in 1-cwt. bags, carriage paid.

BORIC ACID.—Commercial granulated, £28 10s. per ton; crystal, £29 10s.; powdered, £30 10s.; extra finely powdered, £32 10s. in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. GLASGOW: Crystals, £29 10s.; powdered, £30 10s. 1-cwt. bags in 1-ton lots.

CALCIUM BISULPHITE.—£6 10s. per ton f.o.r. London.

CHARCOAL, LUMP.—£6 to £6 10s. per ton, ex wharf. Granulated, £7 to £9 per ton according to grade and locality.

CHLORINE, LIQUID.—£18 15s. per ton, seller's tank wagons, carriage paid to buyer's sidings; £19 5s. per ton, d/d in 16/17 cwt. drums (3-drum lots); £19 10s. per ton d/d in 10-cwt. drums (4-drum lots); 4½d. per lb. d/d station in single 70-lb. cylinders.

CHROMETAN.—Crystals, 2½d. per lb.; liquor. £13 per ton d/d station in drums. GLASGOW: 70/75% solid, £5 15s. per ton net ex store.

CHROMIC ACID.—9d. per lb., less 2½%; d/d U.K.

CHROMIC OXIDE.—11½d. per lb.; d/d U.K.

CITRIC ACID.—1s. 0½d. per lb. MANCHESTER: 1s. 0½d. SCOTLAND: B.P. crystals, 1s. 0½d. per lb.; less 5%, ex store.

COPPER SULPHATE.—£18 5s. per ton, less 2% in casks. MANCHESTER: £19 per ton f.o.b. SCOTLAND: £19 10s. per ton, less 5%, Liverpool in casks.

CREAM OF TARTAR.—100%, 92s. per cwt., less 2½%. GLASGOW: 99%, £4 12s. per cwt. in 5-cwt. casks.

FORMALDEHYDE.—£20-£22 per ton.

FORMIC ACID.—85%, in carboys, ton lots, £42 to £47 per ton.

GLYCERINE.—Chemically pure, double distilled, 1.260 s.g., in tins, £3 17s. 6d. to £4 17s. 6d. per cwt. according to quantity; in drums, £3 10s. 0d. to £4 2s. 6d.

HYDROCHLORIC ACID.—Spot, 5s. 6d. to 8s. carboy d/d according to purity, strength and locality.

IODINE.—Resublimed B.P., 6s. 9d. per lb. in 7 lb. lots.

LACTIC ACID.—(Not less than ton lots). Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £50; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £55; edible, 50%, by vol., £41. One-ton lots ex works, barrels free.

LEAD ACETATE.—LONDON: White, £31 10s. ton lots; brown, £35. GLASGOW: White crystals, £29 10s.; brown, £1 per ton less. MANCHESTER: White, £31; brown, £30.

LEAD, NITRATE.—£32 per ton for 1-ton lots.

LEAD, RED.—£30 15s. 0d. 10 cwt. to 1 ton, less 2½% carriage paid. SCOTLAND: £30 per ton, less 2½% carriage paid for 2-ton lots.

LITHARGE.—SCOTLAND: Ground, £30 per ton, less 2½ %, carriage paid for 2-ton lots.

MAGNESITE.—Calcined, in bags, ex works, about £8 per ton. SCOTLAND: Ground calcined, £9 per ton, ex store.

MAGNESIUM CHLORIDE.—Solid (ex wharf) £5 10s. per ton. SCOTLAND: £7 5s. per ton.

MAGNESIUM SULPHATE.—Commercial, £5 10s. per ton, ex wharf.

MERCURY.—Ammoniated B.P. (white precip.), lump, 5s. 11d. per lb.; powder B.P., 6s. 1d.; bichloride B.P. (corros. sub.), 5s. 2d.; powder B.P. 4s. 10d.; chloride B.P. (calomel), 5s. 11d.; red oxide cryst. (red precip), 7s.; levig., 6s. 6d.; yellow oxide B.P. 6s. 4d.; persulphate white B.P.C., 6s. 1d.; sulphide black (hyd. sulph. cum. sulph. 50%), 6s. For quantities under 112 lb., 1d. extra; under 28 lb., 5d. extra.

METHYLATED SPIRIT.—61 O.P. industrial, 1s. 5d. to 2s. per gal.; pyridinised industrial, 1s. 7d. to 2s. 2d.; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d. more in all cases and the range of prices is according to quantities. SCOTLAND: Industrial 64 O.P., 1s. 9d. to 2s. 4d.

NITRIC ACID.—Spot, £25 to £30 per ton according to strength, quantity and destination.

OXALIC ACID.—£48 15s. to £57 10s. per ton, according to packages and position. GLASGOW: £2 9s. per cwt. in casks. MANCHESTER: £49 to £55 per ton ex store.

PARAFFIN WAX.—SCOTLAND: 3½d. per lb.

POTASH, CAUSTIC.—Solid, £33 5s. to £38 per ton according to quantity, ex store; broken, £40 per ton. MANCHESTER: £38.

POTASSIUM CHLORATE.—£36 7s. 6d. per ton. GLASGOW: 4½d. per lb. MANCHESTER: £37 per ton.

POTASSIUM DICHROMATE.—5½d. per lb. carriage paid. SCOTLAND: 5½d. per lb., net, carriage paid.

POTASSIUM IODIDE.—B.P. 6s. 3d. per lb. in 7 lb. lots.

POTASSIUM NITRATE.—Small granular crystals, £24 to £27 per ton ex store, according to quantity. GLASGOW: Refined granulated, £29 per ton c.i.f. U.K. ports. Spot, £30 per ton ex store.

POTASSIUM PERMANGANATE.—LONDON: 9½d. to 10½d. per lb. SCOTLAND: B.P. Crystals, 10½d. MANCHESTER: B.P. 9½d. to 11½d.

POTASSIUM PRUSSIATE.—5½d. to 6d. per lb. SCOTLAND: 6¾d. net, in casks, ex store. MANCHESTER: Yellow, 6d. to 6½d.

PRUSSIATE OF POTASH CRYSTALS.—In casks, 6¾d. per lb. net, ex store

SALAMMONIAC.—Firsts lump, spot, £42 17s. 6d per ton, d/d address in barrels. Dog-tooth crystals, £35 per ton; fine white crystals, £18 per ton, in casks, ex store. GLASGOW: Large crystals, in casks, £37 10s.

SALT CAKE.—Unground, spot, £3 8s. 6d. per ton.

SODA ASH.—Light, 98/100%, £5 17s. 6d. per ton f.o.r. in bags.

SODA, CAUSTIC.—Solid, 76/77° spot, 13s. 10s. per ton d/d station. SCOTLAND: Powdered 98/99%, £18 10s. in drums, £19 5s. in casks, Solid 76/77° £15 12s. 6d. in drums; 70/73%, £15 12s. 6d., carriage paid buyer's station, minimum 4-ton lots; contracts, 10s. per ton less.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE.—£19-£20 per ton carriage paid North. GLASGOW: £18 10s. per ton net ex store.

SODIUM BICARBONATE.—Refined spot, £10 10s. per ton d/d station in bags in 1-ton lots. GLASGOW: £13 5s. per ton in 1 cwt. kegs, £11 5s. per ton in 2-cwt. bags. MANCHESTER: £10 15s.

SODIUM BISULPHITE POWDER.—60/62%, £12 10s. to £14 per ton d/d in 2-ton lots for home trade.

SODIUM CARBONATE MONOHYDRATE.—£20 per ton d/d in minimum ton lots in 2 cwt. free bags.

SODIUM CHLORATE.—£27 10s. to £32 per ton. GLASGOW: £1 11s. per cwt., minimum 3 cwt. lots.

SODIUM DICHROMATE.—Crystals cake and powder 4½d. per lb. net d/d U.K. with rebates for contracts.

SODIUM CHROMATE.—4½d. per lb. d/d U.K.
4d. per lb. GLASGOW: 4½d. net, carriage paid.

SODIUM HYPOSULPHITE.—Pea crystals, £15 5s. per ton for 2-ton lots; commercial, £11 5s. per ton. MANCHESTER: Commercial, £11; photographic, £15 10s.

SODIUM METASILICATE.—£14 5s. per ton, d/d U.K. in cwt. bags.

SODIUM NITRATE.—Refined, £8 per ton for 6-ton lots d/d. GLASGOW: £1 12s 0d. per cwt. in 1-cwt kegs, net, ex store.

SODIUM NITRITE.—£18 5s. per ton for ton lots.

SODIUM PERBORATE.—10%, £4 per cwt. d/d in 1-cwt. drums.

SODIUM PHOSPHATE.—Di-sodium, £12 per ton delivered for ton lots. Tri-sodium, £16 10s. per ton delivered per ton lots.

SODIUM PRUSSIATE.—4d. per lb. for ton lots. GLASGOW: 4d. MANCHESTER: 4½d. to 5d.

SODIUM SILICATE.—£8 2s. 6d. per ton.

SODIUM SULPHATE (GLAUBER SALTS).—£3 per ton d/d.

SODIUM SULPHATE (SALT CAKE).—Unground spot, £3 to £3 10s. per ton d/d station in bulk. SCOTLAND: Ground quality, £3 5s. per ton d/d. MANCHESTER: £3 10s.

SODIUM SULPHIDE.—Solid 60/62%, Spot, £11 15s. per ton d/d in drums; crystals, 30/32%, £9 per ton d/d in casks. MANCHESTER: Concentrated solid, 60/62%, £11; commercial, £8 10s.

SODIUM SULPHITE.—Pea crystals, spot, £14 10s. per ton d/d station in kegs.

SULPHUR PRECIP.—B.P., £55 to £60 per ton according to quantity. Commercial, £50 to £55.

SULPHURIC ACID.—168° Tw., £4 11s. to £5 1s. per ton; 140° Tw., arsenic-free, £3 to £3 10s.; 140° Tw., arsenious, £2 10s.

TARTARIC ACID.—1s. 1½d. per lb. less 5%, carriage paid for lots of 5 cwt. and upwards. MANCHESTER: 1s. 1½d. per lb. GLASGOW: 1s. 1½d. per lb., 5%, ex store.

ZINC SULPHATE.—Tech., £11 10s. f.o.r., in 2 cwt. bags.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 7d. to 1s. 2d. per lb., according to quality. Crimson, 1s. 6d. to 1s. 7½d. per lb.

ARSENIC SULPHIDE.—Yellow, 1s. 5d. to 1s. 7d. per lb.

BARYTES.—£6 to £6 10s. per ton, according to quality.

CADMIUM SULPHIDE.—3s. 0d. to 3s. 3d. per lb.

CARBON BLACK.—3¾d. to 4 1/16d. per lb., ex store.

CARBON DISULPHIDE.—£31 to £33 per ton, according to quantity, drums extra.

CARBON TETRACHLORIDE.—£41 to £46 per ton, according to quantity, drums extra.

CHROMIUM OXIDE.—Green, 10½d. to 11½d. per lb.

DIPHENYLGUANIDINE.—2s. 2d. per lb.

INDIA-RUBBER SUBSTITUTES.—White, 4½d. to 5½d. per lb.; dark 3½d. to 4½d. per lb.

LAMP BLACK.—£24 to £26 per ton del., according to quantity. Vegetable black, £35 per ton upwards.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE.—Spot, 30%, £16 10s. per ton, 2-ton lots d/d in bags.

SULPHUR.—£9 to £9 5s. per ton. SULPHUR PRECIP. B.P., £55 to £60 per ton. SULPHUR PRECIP. COMM., £50 to £55 per ton.

SULPHUR CHLORIDE.—5d to 7d. per lb., according to quantity.

VERMILION.—Pale, or deep, 5s. per lb., 1-cwt. lots.

ZINC SULPHIDE.—£58 to £60 per ton in casks ex store, smaller quantities up to 1s. per lb.

Nitrogen Fertilisers

AMMONIUM SULPHATE.—The following prices have been announced for neutral quality basis 20.6% nitrogen, in 6-ton lots delivered farmer's nearest station up to June 30, 1939; November, £7 8s.; December, £7 9s. 6d.; January, 1939; £7 11s.; February, £7 12s. 6d.; March/June, £7 14s.

CALCIUM CYANAMIDE.—The following prices are for delivery in 5-ton lots, carriage paid to any railway station in Great Britain up to June 30, 1939; November, £7 12s. 6d.; December, £7 13s. 9d.; January, 1939, £7 15s.; February, £7 16s. 3d.; March, £7 17s. 6d.; April/June, £7 18s. 9d.

NITRO CHALK.—£7 10s. 6d. per ton up to June 30, 1939.

SODIUM NITRATE.—£8 per ton for delivery up to June 30, 1939.

CONCENTRATED COMPLETE FERTILISERS.—£11 4s. to £11 13s. per ton in 6-ton lots to farmer's nearest station.

AMMONIUM PHOSPHATE FERTILISERS.—£10 19s. 6d. to £14 16s. 6d per ton in 6-ton lots to farmer's nearest station.

Coal Tar Products

BENZOL.—At works, crude, 9½d. to 10d. per gal.; standard motor, 1s. 3½d. to 1s. 4d.; 90%, 1s. 4½d. to 1s. 5d., pure 1s. 8½d. to 1s. 9d. GLASGOW: Crude, 10d. to 10½d. per gal.; motor, 1s. 4d. to 1s. 4½d. MANCHESTER: Pure, 1s. 8d. to 1s. 8½d. per gal.; crude, 1s. per gal.

CARBOLIC ACID.—Crystals, 6¾d. to 7¾d. per lb., small quantities would be dearer; Crude, 60's, 1s. 7½d. to 1s. 10d.; dehydrated, 2s. 6d. per gal., according to specification; Pale, 99/100%, per lb. f.o.b. in drums; crude, 2s. 1d. per gal.

CREOSOTE.—Home trade, 3½d. per gal., f.o.r. makers' works; exports 6d. to 6½d. per gal., according to grade. MANCHESTER: 3½d. to 4½d. GLASGOW: B.S.I. Specification, 6d. to 6¼d. per gal.; washed oil, 5d. to 5½d.; lower sp. gr. oils, 5¾d. to 6½d.

CRESYLIC ACID.—97/99%, 1s. 5d. to 1s. 8d.; 99/100%, 1s. 9d. to 2s. 6d. per gal., according to specifications; Pale, 99/100%, 1s. 7d. to 1s. 9d.; Dark, 95%, 1s. 3d. to 1s. 4d. per gal. GLASGOW: Pale, 99/100%, 5s. to 5s. 6d. per gal.; pale, 97/99%, 4s. 6d. to 4s. 10d., dark, 97/99%, 4s. 3d. to 4s. 6d.; high boiling acids, 2s. to 2s. 6d. American specification, 3s. 9d. to 4s. MANCHESTER: Pale, 99/100%, 1s. 8d. to 1s. 9d.

NAPHTHA.—Solvent, 90/160, 1s. 6d. to 1s. 7d. per gal.; solvent, 95/160%, 1s. 7d. to 1s. 8d., naked at works; heavy 90/190%, 1s. 1½d. to 1s. 3d. per gal., naked at works, according to quantity. MANCHESTER: 90/160%, 1s. 5d. to 1s. 7d. per gal. GLASGOW: Crude, 6¾d. to 7¾d. per gal.; 90%, 160, 1s. 5d. to 1s. 6d., 90%, 190, 1s. 1d. to 1s. 3d.

NAPHTHALENE.—Crude, whizzed or hot pressed, £4 10s. to £5 10s. per ton; purified crystals, £10 per ton in 2-cwt. bags. LONDON: Fire lighter quality, £3 to £4 10s. per ton. GLASGOW: Fire lighter, crude, £6 to £7 per ton (bags free). MANCHESTER: Refined, £11 10s. to £13 per ton f.o.b.

PITCH.—Medium, soft, 30s per ton, f.o.b. MANCHESTER: 27s. to 28s. 6d. f.o.b., East Coast. GLASGOW: f.o.b. Glasgow, 35s. to 37s. per ton; in bulk for home trade, 35s.

PYRIDINE.—90/140%, 12s. to 13s. 6d. per gal.; 90/160%, 10s. to 11s. per gal.; 90/180%, 3s. to 4s. per gal. f.o.b. GLASGOW: 90% 140, 10s. to 12s. per gal.; 90% 160, 9s. to 10s.; 90% 180, 2s. 6d. to 3s. MANCHESTER: 11s. to 13s. 6d. per gallon.

TOLUOL.—90%, 1s. 11d. per gal.; pure 2s. 3d. GLASGOW: 90% 120, 1s. 10d. to 2s. 1d. per gal. MANCHESTER: Pure, 2s. 3d. per gallon, naked.

XYLOL.—Commercial, 1s. 11d. to 2s. per gal.; pure, 2s. 3d. to 2s 3½d. GLASGOW: Commercial, 2s. to 2s. 1d. per gal.

Wood Distillation Products

CALCIUM ACETATE.—Brown, £6 15s. to £9 5s. per ton; grey, £8 5s. to £8 10s. MANCHESTER: Brown, £8 10s.; grey, £10.

METHYL ACETONE.—40.50%, £32 to £35 per ton.

WOOD CREOSOTE.—Unrefined, 6d. to 8d. per gal., according to boiling range.

WOOD NAPHTHA, MISCIBLE.—2s. 8d. to 3s. per gal.; solvent, 3s. to 3s. 3d. per gal.

WOOD TAR.—£3 to £8 per ton, according to quality.

Intermediates and Dyes

ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.

ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.

BENZIDINE, HCl.—2s. 7½d. per lb., 100% as base, in casks.

BENZOIC ACID, 1914 B.P. (ex toluol).—1s. 11½d. per lb. d/d buyer's works.

m-CRESOL 98/100%.—1s. 8d. to 1s. 9d. per lb. in ton lots.

o-CRESOL 30/31° C.—6½d to 7½d. per lb. in 1-ton lots.

p-CRESOL, 34-5° C.—1s. 7d. to 1s 8d. per lb. in ton lots.

DICHLORANILINE.—2s. 1½d. to 2s. 5½d. per lb.

DIMETHYLANILINE.—Spot, 1s. 7½d. per lb., package extra.

DINITROBENZENE.—7½d. per lb.

DINITROCHLORBENZENE, SOLID.—£79 5s. per ton.

DINITROTOLUENE.—48/50° C., 8½d. per lb.; 66/68° C., 11d.

DIPHENYLAMINE.—Spot, 2s. 2d. per lb., d/d buyer's works.

GAMMA ACID, Spot, 4s. 4½d. per lb. 100% d/d buyer's works.

H ACID.—Spot, 2s. 7d. per lb.; 100% d/d buyer's works.

NAPHTHIONIC ACID.—1s. 10d. per lb.

β-NAPHTHOL.—£97 per ton; flake, £94 8s. per ton.

α-NAPHTHYLAMINE.—Lumps, 1s. 1d. per lb.

β-NAPHTHYLAMINE.—Spot, 3s. per lb.; d/d buyer's works.

NEVILLE AND WINTHER'S ACID.—Spot, 3s. 3½d. per lb. 100%.

o-NITRANILINE.—4s. 3½d per lb.

m-NITRANILINE.—Spot, 2s. 10d. per lb. d/d buyer's works.

p-NITRANILINE.—Spot, 1s. 10d. to 1s. 11d. per lb. d/d buyer's works.

NITROBENZENE.—Spot, 4½d. to 5d. per lb., in 90-gal. drums, drums extra. 1-ton lots d/d buyer's works.

NITRONAPHTHALENE.—9½d. per lb.; P.G., 1s. 0½d. per lb.

SODIUM NAPHTHIONATE.—Spot, 1s. 11d. per lb.; 100% d/d buyer's works.

SULPHANILIC ACID.—Spot, 8½d. per lb. 100%, d/d buyer's works.

o-TOLUIDINE.—10½d. per lb., in 8/10 cwt. drums, drums extra.

p-TOLUIDINE.—1s. 10½d. per lb., in casks.

m-XYLIDINE ACETATE.—4s. 3d. per lb., 100%.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

DRYSTER, LTD., Barking, oil and varnish manufacturers, etc. (M., 4/2/39.) January 20, charge, to Barclays Bank, Ltd., securing all moneys due or to become due to the Bank; charged on Abbey Grange Works, Hertford Road, Barking. Nil. April 11, 1938.

ELDERS WALKER AND CO., LTD., Gateshead, paint manufacturers. (M., 4/2/39.) January 19, £1,500 (not ex.) mortgage, to Grainger Building Society; charged on 244 Park View, Whitley Bay, and land adjoining. *£15,000 and £4,000 (not ex.) (bankers). June 6, 1938.

NORTH BRITISH ALUMINIUM CO., LTD., London, E.C. (M., 4/2/39.) December 30, charge supplemental to Trust Deed dated September 12, 1934; charged on land at Inverlochy, Kilmonivaig. —. April 12, 1938.

County Court Judgment

KAULVERS, H. (male), 1 Lavers Road, Stoke Newington, manufacturing chemist. (C.C., 4/2/39.) £15 16s. 2d. December 2.

Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

Switzerland.—A firm of manufacturers of road building materials wish to get into touch with United Kingdom manufacturers of white and yellow paint for marking roads, with a view to the sale of a satisfactory product on a representation basis. (Ref. No. 54.)

British India.—A well-established firm of agents at Bombay wishes to obtain the representation, on a commission basis, of United Kingdom manufacturers of patent medicines, toilet preparations, for the Bombay Presidency. (Ref. No. 38.)

Canada.—A firm of wholesale commission brokers and importers at Winnipeg wishes to obtain the representation of United Kingdom manufacturers and packers of powdered edible gelatine, citric and tartaric acids (powdered and crystal) for Western Canada. (Ref. No. 45.)

Egypt.—The Commercial Secretary to H.M. Embassy in Egypt reports that the Egyptian Ministry of the Interior, Prisons Administration, is calling for tenders for the supply and delivery of 227,000 kgs. of Cocoanut oil, 55,000 kgs. of yellow sulphur oil (gift yellow), 18,000 kgs. of olive oil, 12,000 kgs. of raw linseed oil, 12,000 kgs. of palm oil, 118,000 kgs. of hydrogenated fat (vegetable or animal industrial fat), 2,000 kgs. of potassium carbonate 96/98 per cent., 7,000 kgs. of solid caustic potash 88/90 per cent. (potassium hydroxide), 15,000 kgs. of borax. Tenders endorsed "Tender for the supply of oils for soap making" should be addressed to the Director General of Prisons, Cairo, by whom they will be received up to noon on March 14, 1939. A copy of the specifications and conditions of tender may be inspected at the Department of Overseas Trade. (Ref. No. T17940/39.)

British West Indies.—An agent established at Morant Bay, Jamaica, wishes to obtain the representation of United Kingdom manufacturers of patent and proprietary medicines. (Ref. No. 63.)

South Africa.—H.M. Trade Commissioner at Johannesburg reports that the Johannesburg City Council is calling for tenders, to be presented in South Africa by February 22, 1939, for the supply of quantities of aluminium paint. (Ref. T.Y. 17812/39.)

Mexico, Chile and Peru.—A well-established firm of agents established in Mexico, Chile and Peru wishes to obtain the representation of United Kingdom manufacturers of medicinal products and pharmaceutical specialities. (Ref. No. 81.)

Books Received

A Course in Chemical Spectroscopy. By H. W. Thompson. London: Oxford University Press. Pp. 86. 6s.

Textbook of Inorganic Chemistry for Colleges. By James F. Norris and R. C. Young. 2nd edition. Pp. 803. 21s.

Practical Organic Chemistry. By F. G. Mann and B. C. Saunders. London: Longmans, Green and Co., Ltd. Pp. 418. 8s. 6d.

Forthcoming Events

London.

February 6.—University College, Gower Street, W.C.1. 5 p.m. Professor J. H. Burn, "The Action of Drugs in Muscular Fatigue and as Circulatory Restoratives."

Society of Chemical Industry. Burlington House, Piccadilly, W.1. 8 p.m. Dr. L. Levy and D. W. West, "Modern Applications of Luminescent Substations."

February 7.—Northampton Polytechnic, St. John Street, E.C.1. 8 p.m. S. Wernick, "A Decade of Progress in the Electro-Deposition of Metals: The Anodic Oxidation of Light Metals."

Chemical Engineering Group. Joint meeting with the Road and Building Materials Group of the Society of Chemical Industry. Burlington House, Piccadilly, W.1. Dr. L. A. Jordan and P. J. Gay, "Paint Research in Relation to Building."

Royal Institution. 21 Albemarle Street, W.1. 5.15 p.m. M. Polanyi, "An Introduction to Chemical Mechanics."

February 8.—Electrodepositors' Technical Society. Northampton Polytechnic Institute, St. John Street, E.C.1. 8 p.m. H. Sutton and J. W. W. Willstrop, "The Protective Qualities of Anodic Films," and N. D. Pullen, "Some Physical Characteristics of Anodic Films on Aluminium."

University College, Gower Street, W.C.1. 5 p.m. Professor J. H. Burn, "The Action of Drugs in Muscular Fatigue and as Circulatory Restoratives."

February 9.—Sir John Cass Technical Institute, Jewry Street, Aldgate, E.C.3. 7 p.m. S. Judd Lewis, "Spectroscopic Analysis."

Institute of Metals. D. J. Macnaughtan, "Tin—Its Extraction and Uses."

Oil and Colour Chemists' Association. A. Gellman, "The Testing of Refrigerator Finishes."

Chemical Society, Burlington House, Piccadilly, W.1. 5.30 p.m. Joint discussion with the Physiological Society. Professor Dr. G. von Hevesy, "The Use of Isotopes in Biology."

Liverpool.

February 9.—Institute of Chemistry. Reece's Restaurant, Parker Street. 7.30 p.m. C. J. T. Cronshaw, "Quest for Colour."

Manchester.

February 7.—Institute of Fuel. Engineers' Club, Albert Square. 7 p.m. R. B. Robinson, "Pitch as a Fuel."

February 9.—Institute of Chemistry. Engineers' Club, Albert Square. 7.15 p.m. Joint meeting with the Institute of Petroleum. C. J. Kelly, "What Happens to Motor Oil and What Happens to the Engines."

February 10.—Oil and Colour Chemists' Association. Constitutional Club, St. Ann Street. 7 p.m. Dr. F. C. B. Marshall, "Surface Treatment as a Means of Protection of Metals."

Newcastle.

February 8.—Society of Chemical Industry. Symposium: Pigment Manufactures, Fine Particles.

Company News

Gas Light and Coke Co. have declared a dividend on ordinary stock for the December half-year at the rate of £5 12s. per cent. per annum. This makes £5 12s. per cent. for the whole year, or the same as for 1937. The carry forward is reduced from £102,376 to £53,598.

English China Clays Sales Co., Ltd., report profits of £46,539, as against £82,209 for the previous year. A dividend of 1 per cent. (3½ per cent.) on the ordinary shares has been declared.

The Nith Dyeing and Finishing Co., Dumfries, have announced that the business has been taken over by Spray and Burgess, Ltd., in conjunction with Wrights and Dobson Bros., Ltd., dyers and finishers, Nottingham.

The Anchor Chemical Co., Ltd., who became a public company in 1938, report net profits for the year of £26,417. A final ordinary dividend of 10 per cent., making 20 per cent., has been declared.

English Velvet and Cord Dyers' Association., Ltd., report for the year to December 31 trading profits of £13,885 (£42,994). After deducting depreciation and debenture interest, the net loss was £12,827, against a net profit of £15,259.

New Companies Registered

Johnson's (Prestwich), Ltd. 347,670.—Private company. Capital, £1,000 in £1 shares. To carry on the business of consulting, analytical, manufacturing, pharmaceutical and general chemists, herbalists and seedsmen, drug merchants, etc. Directors: John A. Higgins, 2a Bold Street, Southport; Francis W. Flynn. Registered office: 462 Bury New Road, Prestwich.

S. S. Wild, Ltd.—Private company. Capital £3,500 in £1 shares (500 6 per cent. cumulative preference and 3,000 ordinary). To carry on the business of chemical manure and fertiliser manufacturers, dealers and merchants, bone degreasers, analytical chemists, druggists, drysalters, oil and colour merchants, etc. Directors: Sydney S. Wild, 6 Penrith Road, Boscombe, Bournemouth; Sylvia K. Millar. Registered office: 709 Christchurch Road, Boscombe, Bournemouth.